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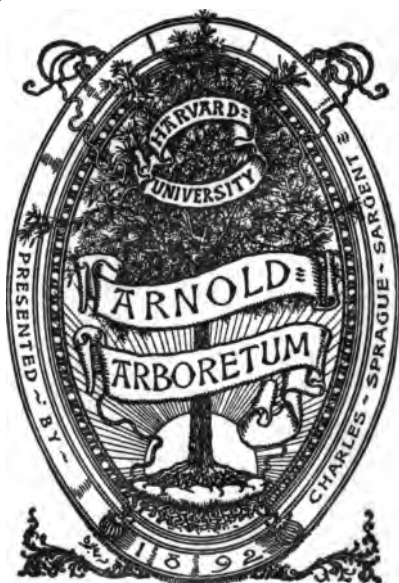
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Issued December 24, 1918.

U. S. DEPARTMENT OF AGRICULTURE. —
BUREAU OF PLANT INDUSTRY.

WILLIAM A. TAYLOR, *Chief of Bureau.*

INVENTORY
OF
SEEDS AND PLANTS IMPORTED

BY THE

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
DURING THE PERIOD FROM OCTOBER 1
TO DECEMBER 31, 1915.

(No. 45; Nos. 41315 to 41684.)



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INVENTORY OF SEEDS AND PLANTS IMPORTED BY THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION DURING THE PERIOD FROM OCTOBER 1 TO DECEMBER 31, 1915 (NO. 45; NOS. 41315 TO 41684).

INTRODUCTORY STATEMENT.

Although this inventory chronicles the arrival of only 370 new plant immigrants, it describes some that are of unusual interest and deserving of special mention. It covers certain plants of the high Peruvian Andes collected by Mr. O. F. Cook while attached to the Yale University-National Geographic Society Expedition. These include a remarkable wild relative of the tomato (No. 41318), which has a pleasant, slightly acid flavor, resembling that of an apple, and remarkable keeping qualities which may make it of particular interest to tomato breeders; one of the Mutisias (No. 41317), a large trailing composite vine worthy of trial in our greenhouses for its beautiful orange to scarlet pendent flowers, which suggest thistles; a passion fruit (No. 41316), the pulp of which separates from the hard shell, making it possible to peel the shell away; the tara (*Caesalpinia pectinata*, No. 41323), a spiny leguminous tree or shrub which may make a striking hedge plant in our Southwestern States, its bright scarlet pods contrasting with its deep polished-green leaves as holly berries do; the tasta (No. 41324), a fine-leaved shrubby Escallonia, which may make a desirable hedge plant as far north as San Francisco; the lengli (*Hesperomeles oblonga*, No. 41325), an attractive tree with evergreen leaves and brilliant red fruits, hanging on all winter like holly berries; the capuli cherry of Peru (*Prunus salicifolia*, No. 41328), from an altitude of 12,000 feet, which resembles a chokeberry but has a firm flesh of good texture and agreeable taste; a variety of the sweet cassava (*Manihot dulcis*, No. 41320), which species, according to Cook, is represented by varieties maturing at 6,000 feet on the eastern slopes of the Andes and in the cold cloudy coastal climate of the Pacific coast; a species of tree (*Datura sanguinea*, No. 41329), with green, orange, and scarlet flowers, which occurs where heavy frosts are encountered every night; the lucuma of Peru (No. 41332), a popular fruit with rich mealy

flesh, resembling a cooked sweet potato, and with a hardness which presumably will enable it to be grown in California and Florida; a South American walnut (*Juglans* sp., No. 41334), of distinct value to plant breeders, the bark of which is used for dyeing wool the color of the famous vicuña ponchos; and a remarkable species of the papaya (No. 41339), which produces fruits that will keep for two weeks or more after they are ripe and which are as deliciously fragrant as a well-ripened muskmelon and of excellent flavor but tough texture. Although the quinoa (*Chenopodium quinoa*, No. 41340) has often been introduced into America and has nowhere yet found a home, it is important to get an opinion regarding this plant from a keen observer and thoroughly trained agricultural explorer. Mr. Cook reports that previous to the introduction of wheat and barley this cultivated pigweed was one of the two most widely grown crops of the remarkable Inca civilization, that it is pronounced by a Scotchman resident there to-day as being better than oatmeal for a breakfast food, and that it appears very vigorous and productive and may possibly be gathered and thrashed by machinery.

Among the introductions sent in by correspondents or collected by travelers, there are several unusual things covered by this inventory. To Rev. George Campbell, the American missionary who has sent in so many interesting plants from South China, we are indebted for a most remarkable dwarf peach (No. 41395), which is handled as a pot-grown tree in China and which he says comes true to seed. He reports that one small tree 15 inches high with a stem no larger than a lead pencil ripened five good-sized edible clingstone peaches. The behavior out of doors at Chico of a number of seedlings of this peach suggests the possibility of a dwarf race of peach trees of value as fruit producers and for plant breeding. Mr. Carlos Wercklé, of Costa Rica, sends seeds of the sansapote (*Licania platypus*, No. 41393), the most beautiful forest tree in Costa Rica, which grows to gigantic size, bears an edible fruit, and produces timber nearly as good as the Cedrela timber of Cuba. Mr. A. Rolloff, director of the Tiflis Botanic Garden, who has sent so many new hardy plants from the Caucasus, presents us with seeds of the beautiful sulphur-yellow peony (No. 41476), recently discovered near Lagodekhi in eastern central Caucasus by Mlokošewitsch, for whom it was named. *Cara-gana arborescens* has become almost a necessary hedge and shelter-belt plant on the Canadian Great Plains, and it is coming to be better appreciated in our own Northwest. A beautiful, striking, prostrate form (No. 41480) to which Mr. Norman M. Ross, of Indian Head, directed attention last year, and which he has since sent us,

can scarcely fail to be of value for dooryard planting in the coldest portions of our country.

It always gives a feeling of satisfaction to realize that a tree introduction has reached a stage where it is producing a supply of seed in this country. The Queensland nuts (No. 41472) sent in from Homestead, Fla., by Mrs. L. L. Bow were produced by a tree sent to her by this office in 1911. Its productiveness and the quality of the nuts indicate that this new nut tree, which furnishes a basis for a small industry in Australia, is a promising one for both Florida and California.

Collections of seven winter-wheat varieties (Nos. 41510 to 41516) from Baluchistan, presented by Mr. A. Howard, of the Indian Service, and of 18 varieties (Nos. 41342 to 41356 and 41682 to 41684) from Pusa, India, should yield something valuable for the wheat breeders.

The hybrids between the American chinkapin and the Japanese chestnut (Nos. 41357 to 41360), made by Dr. Walter Van Fleet, bear nuts which in size and sweetness should recommend them to the serious attention of nut growers.

The Mascarene grass (*Osterdamia tenuifolia*, No. 41509), which has been used so extensively by the Japanese for lawns, but which comes to us from the island of Guam, has already shown its remarkable lawn-making character in southern Florida, where lawns are most difficult to maintain.

A species of *Rubus* (No. 41676) from India, making a growth of 20 feet and said to be the most robust of the genus, together with five other species from the same section of the Himalayas, may have special interest for breeders, even though they may not do well generally.

Those Americans who have tried in vain to grow as a border plant the brilliant *Calceolaria*, so common in Great Britain, may be glad to test as a substitute the Australian *Crotalaria* (No. 41571), which Mr. James Pink, who sends it in, predicts will be highly successful in borders in dry situations.

The Pondoland cocos (*Jubaeopsis caffra*, No. 41484) will have a botanical interest to all palm lovers as the only members of the tribe to which the coconut belongs which occurs in Africa, all the others being inhabitants of the Western Hemisphere.

Chinese place and plant names in this inventory have been brought, so far as possible, into accord with the best authorities, the geographic names (except when fixed by decisions of the United States Geographic Board) being given in the form accepted by the Chinese Ministry of Communications Postal Guide. Many of the smaller vil-

lage names, however, are not listed therein, and in all such cases the location of the village is given with reference to the nearest town mentioned in that work.

The manuscript of this inventory was prepared by Miss May Riley, the botanical determinations of seeds introduced were made and the notes on geographic distribution compiled by Mr. H. C. Skeels, while the descriptive and botanical notes were arranged by the late Mr. S. C. Stuntz.

DAVID FAIRCHILD,
Agricultural Explorer in Charge.

OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION,
Washington, D. C., May 31, 1918.

INVENTORY.

41315. *LILIUM PHILIPPINENSE* Baker. Liliaceæ. Benguet lily.

From Manila, Philippine Islands. Bulbs presented by Mr. A. Hernandez, acting Director of Agriculture. Received October 4, 1915.

"Grown at La Trinidad Experiment Station, Trinidad, Benguet, P. I." (Hernandez.)

A delicately fragrant lily from the Philippine Islands, with pure waxy white, usually solitary flowers, tinged green near the base, 6 to 9 inches long and 4 to 6 inches wide. It is best suited for pot culture in the Northern States. (Adapted from Bailey, *Standard Cyclopædia of Horticulture*.)

On account of its narrow leaves it will probably not be of any great importance except possibly in breeding work.

41316 to 41341.

Collected by Mr. O. F. Cook, of the Bureau of Plant Industry, on the Yale University-National Geographic Society Expedition to Peru. Received October 5, 1915. Quoted notes by Mr. Cook, unless otherwise indicated.

41316. *PASSIFLORA* sp. Passifloraceæ.

Tumbo.

"(No. 228. Tinta, Peru, April 16, 1915.) Seeds collected in the Vilcanote Valley, at an altitude of more than 10,000 feet. A large vine with deeply 3-parted leaves, very rugose and deeply veined above, cottony white below, petioles and young stems also with cottony pubescence; petals pale pink, slightly darker than the lobes of the calyx, the fringe bright blue, less than half as long as the petals, but more than a third as long, rising from a white fleshy ring that borders the mouth of the tube; fruit strongly pubescent when young, more thinly so when mature, becoming pale yellowish or speckled and tinged with dull purplish on the exposed side. On account of the texture, pubescence, and the colors the surface of the fruit has somewhat the appearance of a light-colored peach. The shape of the fruit is nearly globose, but the ends are distinctly flattened; length 5 cm., width 5.7 cm. The outer wall of the mature fruit separates readily from a soft white inner skin which adheres closely to the pulp mass and holds it together, so that the outside shell can be broken away without danger of losing the pulp or seeds, the pedicel serving as a convenient handle during the operation. The inner skin can then be pulled away or eaten with the pulp. The ready separation of the wall into the two layers may give this species an advantage as a table fruit, for it can be eaten, like a kid-glove orange, without wetting the fingers, or it can be brought to the table ready to eat, with the outer shell taken off, but the pedicel left as a handle. The pulp mass, in addition to being held together by the inner skin, is rather firm. The flavor of the pulp is excellent, very pleasantly acid, and perhaps more like a cherry than any other temperate fruit with which it might be compared. The seeds are also somewhat smaller than those of most of the species that are grown for their fruits. The vine is a very beauti-

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

ful climber and the flowers are magnificent, not so strikingly colored as some of the passion flowers, but a very attractive pink."

41317. MUTISIA sp. Asteraceæ.

"(No. 834. San Miguel and Torontoy, Peru, June 9, 1915.) Seeds of a large trailing vine with a magnificent flower. The rays attain a length of nearly 5 cm. and are recurved against the involucre, which is covered with long, recurved, channeled scales, appearing spinelike and suggesting a thistle, but not stiff or sharp. The flowers are pendent and have a stalk 6 to 10 inches long. The rays are orange at the base, passing through scarlet and scarlet red and then to deeper shades, finally discoloring to black. The anthers are dark brownish and the style yellow, tipped with red. The rays are of firm texture and evidently remain showy for a long time, several days at least. Probably would not thrive outside of a greenhouse unless in Florida or California."

41318. LYCOPERSICON sp. Solanaceæ.

Wild tomato.

"(No. 1185. June 10, 1915.) Seeds of a wild tomato growing near a small watercourse between Ollantaytambo and Torontoy and about 1 league above the latter place, at an altitude of more than 8,000 feet, in a rather dry district, with cacti and other desert vegetation. Only one plant was found at the place where the fruit was obtained, though the species was noticed two or three times in other localities. The vine was large and woody, trailing over bushes 10 to 12 feet high. The foliage, flowers, and fruit have much the same form as those of the cultivated tomato. The flowers are of a bright yellow color, but the fruits remain green, even when the seeds are mature. Finally they become somewhat yellowish, but with no approach to the bright colors of the cultivated varieties. The fruit also lacks the characteristic odor and taste of the tomato, but has a pleasant, slightly acid flavor, more like that of the apple. Another difference is that the outer wall is much firmer in texture than in the cultivated tomato, and the keeping qualities are apparently very much better. Fruits collected on June 10 and brought to Ollantaytambo in a saddlebag remained apparently unchanged, with no signs of decay or withering, until July 20, and some of them were still fresh when they reached Washington in September.

"In addition to the botanical interest attaching to this plant as a wild relative of the tomato, there is the possibility of making use of it in hybridizing and breeding new varieties. If such a cross can be made, it may be expected to give a wide range of variation and yield new types of fruit adapted to special purposes, such as woody perennial varieties that can be trained over arbors like grapevines, or varieties with special flavors, greater firmness of flesh, and improved keeping qualities. An increase of hardness might also be expected, in view of the fact that this species grows wild at a rather high altitude in a valley bordered by high mountains with perpetual snow fields. The nights are very cold, with frequent frosts during the winter season. The fruits are over an inch in diameter, several times as large as those of the red-fruited wild tomato found later at Santa Ana, from which the cultivated tomato appears to have been derived. The fruits are borne in large flat clusters on a dichotomously (?) branched inflorescence that becomes stiff and woody as the fruits mature. The Indians are said not to use the fruit, but the plant is supposed to have medicinal properties."

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)**41319. RUBUS sp. Rosaceæ.****Raspberry.**

"(No. 1233. Panticalla Valley, Peru, July 18, 1915.) Seeds of a raspberry of possible interest to breeders on account of the extremely large size of the fruits, which attain a length of nearly an inch and a half and a diameter of more than an inch. The color and general appearance are much like our red raspberry, but there is a solid fleshy core, like a blackberry. The vine is a large and very vigorous climber, with fresh bright-green foliage, the stems and petioles being armed with rather scattering hooked spines. The flowers are pinkish purple."

41320. MANIHOT DULCIS (Gesner) Baillon. Euphorbiaceæ.**(*Manihot palmata* Muell. Arg.)****Sweet cassava.**

"(No. 1680. Santa Ana, Peru, July 6, 1915.) Dried fruits of the cassava plant, known in most Spanish-speaking countries as *yuca*, which is an important root crop in most parts of tropical America. In many regions cassava is a staple article of diet, as the potato is with us, and in some respects it is superior to the potato, notably in having a richer flavor. The flavor of the fresh cassava is entirely lacking in tapioca, which is the only product of cassava widely known in the United States. The cassava would be a valuable addition to the agriculture of the United States, and especially in the warmer parts of the country where the summer weather is too hot for the potato, but thus far it has remained confined to the warmest districts of the Gulf States, on account of the very long season required to mature the crop. The prospects of more general utilization of the cassava in the United States depend obviously on the possibility of securing varieties that will grow in a shorter season or with less heat. The behavior of cassava in Peru may be said at least to justify a renewed hope of securing varieties that can be raised more widely in the United States than any that have been available in the past. On the eastern slope of the Andes the cultivation of the sweet cassava extends to an altitude of 6,000 feet, and it is also grown along the Pacific coast in a climate that is cold and cloudy for much of the year. The Peruvian varieties should be tested in southern California, as well as in the Gulf and South Atlantic States."

41321. CANNA EDULIS Ker-Gawler. Cannaceæ.**Achira.**

"(No. 1732. Peru.) Seeds of a wild species growing in the Urubamba Valley between San Miguel and Torontoy at altitudes of 6,000 to 8,000 feet. The plant is said to be the same in every respect as the cultivated *achira* of this district, except that it does not have the enlarged fleshy rootstocks. It usually grows in rather densely wooded situations and behaves in all respects like a wild plant. The plant is larger and the flowers are smaller than those of another species of *Canna* that grows farther down the valley at Santa Ana, and the color and shape of the flowers are also different. Unlike the Santa Ana species, the petals have little of the bright red or scarlet, but more subdued yellowish or pinkish shades not easily identified with any of the Ridgway color standards. The middle of the petals is nearly orange-chrome, but most of the neighboring colors are represented, with the margins nearly scarlet, or with various pinkish shades, or toned down into such colors as apricot-orange and the neighboring shades, rufous and carnelian red. The calyx inclines to pinkish, and the fruit spines are tinged with Pompeian red."

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)**41322. MANIHOT DULCIS** (Gesner) Baillon. Euphorbiaceæ.(*Manihot palmata* Muell. Arg.)**Sweet cassava.**

“(No. 1768. Dried fruits from San Miguel, Peru, July 10, 1915.)”

For description, see No. 1680 (S. P. I. No. 41320).

41323. CAESALPINIA PECTINATA Cav. Cæsalpiniaceæ.**Tara.**(*Caesalpinia tinctoria* Domb.)

“(No. 1795. Seeds from Peru.) A tall, upright, spiny shrub or small tree, often planted for hedges, especially in the district around the town of Urubamba, but very abundant in the wild state farther down the Urubamba Valley, between Ollantaytambo and Torontoy, at altitudes of 8,000 to 10,000 feet. Here it grows under much the same conditions as the *molle* or pepper tree, though going into somewhat lower and drier situations. Yet the *tara* does not extend into the parts of the valley that are occupied by tropical types of vegetation, as at San Miguel, nor were any seen in the region of Santa Ana. The habit of growth and general appearance of the *tara* are striking, the trunk or trunks being strictly upright, with a few spreading branches near the top. The largest trees attain a height of 25 to 30 feet, with trunks 6 to 8 inches in diameter. The foliage is deep green in color, with the leaflets smooth and polished on the upper surface. The greenish yellow flowers in cylindrical open spikes are not very conspicuous, but the pods are produced in large clusters, and the exposed surfaces show a bright scarlet for a long time before maturing. The color affords a very attractive contrast to the leaves, and from a distance the effect is the same as though the trees were producing clusters of red flowers. In addition to the possibility of using the *tara* as an ornamental, it might have value as a hedge plant or windbreak, especially in the drier, warmer parts of the Southwestern States. The tendency of many hedge plants to spread out laterally and occupy too much ground is not shared by the *tara*, for all the shoots grow nearly upright, making a very close and effective hedge, the bark being studded with short spines. The spines may afford an objection to the use of the *tara* as an ornamental in some situations, but they will add to its value as a hedge plant. A well-grown hedge of *tara* keeps out cattle, pigs, or goats, as well as human intruders. The growth of the young plants is said to be very rapid, the wood being rather soft and not durable. New shoots are formed readily after cutting back, but there are no sprouts from the roots. No information could be secured regarding the feasibility of propagating from cuttings. The hedges about Urubamba are said to be grown from seedlings.

“A further consideration is that the pods of the *tara* might be found to have economic value for tanning or dyeing, like the *divi-divi* and other species of *Caesalpinia*. In former years it was customary in Peru to make ink of the pods by grinding them and adding a little sugar and verba buena to give luster. The same preparation was used for dyeing black. The ink was said to be of good quality and continued in use in the district of Ollantaytambo until recent years, when supplies of imported ink were available. In the market in Lima *tara* pods are a regular article of trade and are said to be used for dyeing, tanning leather, and making ink.

“The immature seeds of the *tara* contain, underneath the skin, a layer of fleshy opalescent material, with a rather pleasant, slightly sweetish taste, which is considered edible, like the arillus of the seeds of Inga and

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

other leguminous trees; but in the *tara* the small size of the seeds makes it difficult to extract the edible material, which is also rather tough and tasteless.

"A few trees of *tara* or a related species were seen about Lima, but they were much less upright than those about Urubamba. If the trees should behave in this manner in California it would be much less desirable for the purposes considered above. The *tara* about Lima, however, may be a different variety. It was noticed that the pods offered in the market were broader than those of the trees of the interior valleys."

For an illustration of the *tara*, see Plate I.

41324. ESCALLONIA sp. Escalloniaceæ.**Tasta.**

"(No. 1827. Seeds from Pinasniocj, Peru, July 14, 1915.) A fine-leaved tree, comparable to the boxwood in foliage, but with horizontal branches and a more open habit of growth, which often produces an artistic effect like some of the dwarfed Chinese evergreens. The appearance is also somewhat similar to that of the *chachacoma* (*Escallonia resinosa*, S. P. I. No. 41326), but the foliage is much finer and of a dark and more shining green. Like the *chachacoma*, the tree will endure cutting back to any extent, and the new crown soon takes a graceful rounded shape. This may render the *tasta* very useful for ornamental planting in situations where space is limited, and it should also serve well as a hedge plant. Old trees have deep-red heartwood of the same texture and appearance as the wood of *chachacoma*, and are said to be used in the same way. The form of the fruits also suggests affinity with that tree, and the habit of growth is similar, but the flowers are solitary instead of clustered. The color of the flowers is said to be white, as in *chachacoma*. The leaves of young vigorous shoots are much larger than those of mature branches and are distinctly dentate. Like *chachacoma* the tree may be rooted from cuttings and layered branches. It ascends to higher elevations than *chachacoma* and may be expected to have greater resistance to cold, but less resistance to heat. It may thrive along the California coast as far north as San Francisco and might become popular as an ornamental or hedge plant."

41325. HESPEROMELES OBLONGA Lindley. Malacææ.**Lengli.**

"(No. 1874. Dried fruits from Pinasniocj, Peru, July 14, 1915.) A tree growing at altitudes of 10,000 to 12,000 feet, found in the valleys of the two streams tributary to the Urubamba River, on the stream that enters at Ollantaytambo and the other the stream that comes down from the Panticalla Pass a few miles below Ollantaytambo. On the other side of the pass in the upper part of the Lucumayo Valley the *lengli* appears to be absent. In unfavorable places where the trees remain stunted they have an appearance somewhat like our thorn-apple or hawthorn, but in some of the sheltered ravines and reforested terraces where the conditions are more favorable the *lengli* trees attain a height of 30 to 40 feet, with trunks 1 to 2 feet in diameter having a very attractive appearance. The foliage is very fine, the leaves being of a very regular elliptical shape with slightly dentate margins. The upper surface is of a fresh deep-green color with neatly impressed veins, while the lower surface has a warm reddish brown tomentum, affording a very pleasing contrast. The fruit clusters give a festive appearance like holly, the mature berries being deeply and richly colored. They begin by changing from green through various shades of pink to

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

scarlet red and then pass on through the darker shades of red, becoming eventually almost black. The berries are distinctly flattened instead of round and have the appearance of very small apples. They hang on the trees for a long time, probably all through the winter, with the effect of the Christmas holly. A botanical peculiarity, perhaps of this species, is that the lowest branch of the fruit cluster is usually subtended by a very much reduced, oval, sharp-pointed leaf or bract, but is like the other leaves in color, texture, and persistence. The small leaf adds a little touch to the appearance of a twig with its cluster of berries. This tree might prove attractive for ornamental planting along the California coast or wherever it will grow. In view of the high altitude where the tree is native it may be expected to stand cold weather, if not actual frost."

For an illustration of the lengli, see Plate II.

41326. ESCALLONIA RESINOSA (R. and P.) Persoon. Escalloniaceæ.

Chachacoma.

"(No. 1886. Seeds from Ollantaytambo, Peru, July 14, 1915.) A handsome tree, bearing clusters of white flowers. It is common in the valleys about Ollantaytambo at altitudes of 9,000 to 11,000 feet. In the lower valleys, where the climate is dry, the *chachacoma* grows intermingled with cacti and other desert vegetation and seldom attains a height of more than 12 to 15 feet. In the upper valleys, where the climate is cooler and the supply of moisture is ample, the *chachacoma* trees grow to much larger size, often attaining a height of 40 to 50 feet and a diameter of 2 to 4 feet. The largest trees were seen in the valley below Panticalla Pass, on the south side, but none were found on the north side, in the region of Yanamachi."

For an illustration of the chachacoma, see Plate III.

41327. CITHAREXYLUM sp. Verbenaceæ.

"(No. 1888. Dried fruits from Pinasnioj, Peru, July 17, 1915.) A tree or shrub with small yellowish green leaves and slender, square, angular, green branches. Grows in the dry lower valleys as a bush, but in favorable situations attains a diameter of over a foot. The general appearance is somewhat like box when the foliage is close, as in the dry valley between Torontoy and Ollantaytambo. It might be expected to grow in the same places as the California pepper tree (*Schinus molle*) and would serve better than that tree as a hedge or windbreak. It stands severe cutting back and apparently springs up rapidly. The mature berries are red. Those collected were from trees about a league below Pinasnioj at an altitude of about 10,000 feet."

41328. PRUNUS SALICIFOLIA H. B. K. Amygdalaceæ.

Capuli.

"(No. 1913. Seeds from Ollantaytambo, Peru, July 19, 1915.) A tree very common throughout the Urubamba and Vilcanota Valleys at altitudes of 12,000 feet and under. The lower limit of the *capuli* in the Urubamba Valley is near Torontoy at an altitude of about 8,000 feet. The flowers and fruits are borne in clusters, and the general appearance is much like the chokecherries of the United States, but the fruit is unlike the chokecherry in having a thick, firm flesh and an agreeable taste. Though not highly flavored, it is pleasant and juicy and of good texture and is sold in quantities in the markets of Cuzco and other towns of the plateau region. It is the only kind of cherry that is grown in quantities in this region. The ripe fruit begins to appear on the market in Novem-

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

ber and continues until April, coming probably from different altitudes. The size is that of a rather small cherry and the color a deep reddish purple, becoming nearly black with maturity. The leaves, stems, and bark are strongly charged with prussic acid and are very bitter to the taste. The trees are usually 20 to 30 feet high, but often of large size, 40 feet or over, with trunks 2 feet in diameter. Many are found in a wild or half-wild state, quite independent of cultivation. This was observed particularly in the neighborhood of Sicuani at an elevation of about 12,000 feet. Nevertheless, it is not certain that the species is a native of Peru. At Lima the same name, *capuli*, is applied to an altogether different type, a small plant of the genus *Physalis*, related to the tomato, but with the fruits small and inclosed in a large papery calyx like the so-called strawberry tomato, known in some parts of the United States. As the *capuli* tree appears to be a healthy, vigorous, rapid-growing type, it may be worthy of a trial along the Pacific coast. The possibility of using it as a stock for other cherries or for the production of desirable hybrids is also worth considering, but the species is not closely related to our cultivated cherries and may need to be looked upon as a distinct type to be improved through selection rather than by hybridization."

41329. DATURA SANGUINEA Ruiz and Pavon. Solanaceæ.

Puca campacho.

"(No. 1915. Peru, July 14, 1915.) Seeds from above Pinasnioj, Panticalla Pass, at an altitude of about 12,000 feet. A large treelike species, somewhat smaller than *D. arborea*, with smaller leaves and more narrowly tubular flowers. The corolla tube is green at the base, orange yellow in the middle, and scarlet at the mouth. In addition to these striking differences, the species should be much more hardy than *D. arborea*, which appears in Peru to be a native of the lower tropical valleys, while *D. sanguinea* extends to the high altitudes where heavy frosts are encountered every night."

41330. LUPINUS CRUCKSHANKSII Hooker. Fabaceæ.

Tarhui.

"(No. 1919. Seeds from Ollantaytambo, Peru, July 20, 1915.) Apparently a native species, commonly cultivated at altitudes of 9,000 to 11,000 feet. The pods are very thick and fleshy, with distinct but not prominent irregular veins; the surface glaucous and somewhat pubescent, but not very densely so. Flowers very handsome, the banner erect, blue at the sides, then white, but yellow in the lower half of the middle, the lower petals deeply blue, covering the whitish keel. Flowers usually in whorls of five, four, or three. Leaves naked above, sparsely hairy beneath, glaucous. Seeds pure white. Said not to yield very well. After being ground into meal this has to be soaked several days in running water to extract the bitter taste; considered a delicacy, notwithstanding the difficulty of preparation."

41331. PASSIFLORA sp. Passifloraceæ.

Tumbo.

"(No. 1922. Seeds from Ollantaytambo, Peru, July 19, 1915.) Leaves somewhat like that of the Tinta species, but upper surface much smoother and under surface not so cottony. Flowers without fringe, very similar to those from Tinta, except for the absence of tentacles, involucre with bracts united, and fruit with yellow pulp, attaining a length of 3 cm. and a width of 4 cm. The skin surrounding the pulp very thin and tough, surface of fruit strongly pubescent, with simple

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

erect hairs, but surface of calyx tube naked. The pulp has a rather strong, distinctly acid taste, quite different from most other edible *Passifloras*. It might not find favor with the American public, but is distinctly worth trying. There is a decided tang, something like that of a tomato. The plant is found commonly growing by roadsides around Ollantaytambo, in places altogether uncultivated, and may be considered a native of this district."

41332. LUCUMA OBOVATA H. B. K. Sapotaceæ.**Lucuma.**

"(No. 1925. Seeds from Ollantaytambo, Peru, June 10, 1915.) The *Lucuma* is a popular fruit tree in Peru. It is closely related botanically to the *sapote* and *injerito* of Central America, but the quality of the fruit is entirely different. The flesh is very rich and mealy, more like a cooked sweet potato than like the related fruits. The tree is also of a very compact habit of growth, with the rather small obovate leaves clustered closely near the ends of the branches. Another difference is that the *Lucuma* grows and produces fruit at a much higher altitude than the *sapote*, attaining about 9,500 feet at Ollantaytambo, so that there would seem to be a much better chance for the *Lucuma* in California or Florida than for the *sapote*."

41333. CAESALPINIA PECTINATA Cav. Caesalpinaceæ.**Tara.***(Caesalpinia tinctoria Domb.)*

"(No. 2046. From Peru, July 17, 1915.) Seed from Urubamba Valley, between Torontey and Ollantaytambo. Like S. P. I. No. 41323, but from a different tree."

41334. JUGLANS sp. Juglandaceæ.**Nogal.**

"(No. 2047. Seeds from Ollantaytambo, Peru, July 22, 1915.) A native walnut cultivated sparingly at Ollantaytambo and in the valley above and below. Its chief use is to furnish a dye to give sheep's wool the brown color of the high-priced vicuña ponchos. The leaves and bark of the tree are used for dyeing, the coloring material being extracted by beating and boiling. The nuts are as large as English or Persian walnuts, but the shell is much thicker. The tree is rather small and slender, with large graceful leaves, reminding one of the sumac or *Ailanthus*. Of interest for breeding purposes or for ornamental planting along the Pacific coast or in Florida. Probably a native of the valleys of the eastern slopes of the Andes."

41335. CHENOPODIUM HASTATUM Philippi. Chenopodiaceæ. Cañihua.

"(No. 2148. Seeds from Cuzco, Peru, July 20, 1915.) A second cultivated species of *Chenopodium*, grown only at very high altitudes. Seen only in the valley on either side of the Pass of La Raya. Both the plant and the seeds are much smaller than the *quinoa*. *Cañihua* is usually planted after potatoes, with no attempt at other cultivation. The seeds are toasted and ground into meal. The *cañihua* is used chiefly as a travel ration and by shepherds who go out with their flocks on the Andean pastures."

For an illustration of the *cañihua*, see Plate IV.

41336. OCUCURBITA sp. Cucurbitaceæ.**Zapallo macri.**

"(No. 2049. Seeds from Lima, Peru, August 16, 1915.) Very large fruits, attaining 2 feet in diameter, globose-ovate, fusiform, or depressed. Surface either light gray, deeper bluish gray, or yellowish, smooth or with shallow furrows or with scattered corky lines."



THE TARA, A NEW PLANT FOR HEDGES AND WINDBREAKS, FROM PERU (*CAESALPINIA PECTINATA* CAV.), S. P. I. NO. 41323.

An upright shrub or small tree, often planted for hedges in parts of Peru. The habit of growth of the tara peculiarly fits it for a hedge plant or windbreak. The trunk or trunks are upright, with a few spreading branches near the top, and the bark is studded with short spines. Tara pods are a regular article of trade in the market of Lima, and are said to be used for dyeing, tanning leather, and making ink. This plant should prove valuable in many situations in the South. (Photographed, natural size, by the Yale University-National Geographic Society Expedition, July, 1915; P17974CA.)



THE LENGLI, AN INTERESTING ORNAMENTAL TREE OF PERU (HESPEROMELES OBLONGA LINDLEY), S. P. I. No. 41325.

This tree, commonly known as the lengli, grows in the mountains of Peru at altitudes of 10,000 to 12,000 feet. Where conditions are favorable, the tree attains a height of 30 to 40 feet, with a trunk diameter of 1 to 2 feet. The oval leaves are green above and reddish brown tomentose beneath. The fruit is richly colored, being pink when young and passing all the shades of red until almost black when ripe. The mature fruit hangs on the tree for a long time. The tree may be expected to stand cool weather and even frost. (Photographed, slightly reduced, by the Yale University-National Geographic Society Expedition, July, 1915; P18945CA.)



THE CHACHACOMA OF PERU (*ESCALLONIA RESINOSA* (R. AND P.) PERBOON), S. P. I.
No. 41326.

A handsome tree, producing clusters of white flowers for a long period during the winter months. It thrives in the high valleys of Peru at altitudes of 9,000 to 11,000 feet. Here it attains a height of 40 to 50 feet and a diameter of 2 to 4 feet. In the lower valleys, where the climate is dry, this tree grows intermingled with cacti and other desert vegetation, but it seldom attains there a height of over 15 feet. It has not heretofore been grown in the United States. (Photographed, natural size, by the Yale University-National Geographic Society Expedition, July, 1915; P17890CA.)



THE CAÑIHUA, A CULTIVATED FOOD PLANT FROM THE HIGH ANDES (*CHENOPODIUM HASTATUM PHILIPPI*), S. P. I. NO. 41335.

The shepherds who live in the higher altitudes of the Peruvian Andes use the seeds of this plant for food. The seeds are toasted and then ground into meal and used principally as a travel ration, quantities of it being taken by the shepherds when they go out with their flocks on the Andean pastures. The plant and seed are much smaller than the better known quinoa. This species is grown only at very high altitudes. It was seen by Mr. O. F. Cook only near the Pass of La Raya. The photograph shows seedlings (much reduced) in different stages of development. (Photographed by the Yale University-National Geographic Society Expedition, July, 1915; P17786CA.)

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

41337. CUCURBITA sp. Cucurbitaceæ.

Zapallo abin.

"(No. 2050. Seeds from Lima, Peru, August 16, 1915.) A medium-sized squash of the same general form as the *loche*, but much larger and distinctly grooved. Rough with coarse warts, which are sometimes confluent, but usually distinct. Color on the outside, deep dull salmon yellow, in places finely mottled with olive green; on the inside, deep yellow. Flesh much thicker at the neck than at the large end, but neck not solid."

The *loche* is a squash of the general form of the ordinary crookneck, but with straight neck. No seeds of this plant were received.

41338. SOLANUM sp. Solanaceæ.

Sacapari.

"(No. 2052. Dried fruits from Copacabana, Bolivia, August 8, 1915.) A hardy species, with bluish violet flowers, apparently the same as that obtained near Puquiuira, on the border of the Anta Plain in Peru, between Huarcoonda and Cuzco, at an altitude of about 12,000 feet. At Copacabana it blossomed profusely in midwinter, when no other plants were flowering. Shrub not so large as the Puquiuira one, 3 to 5 feet, but woody. To keep in good condition it would probably need pruning or cutting back to the ground occasionally, but would probably live for many years, and could be used as a hedge or screen. The fruits turn a transparent reddish yellow at maturity, but are black when dry. How much frost it will endure is not known, but a plant that will endure freezing every night in the blossoming season should be of interest throughout the Southwest. At Copacabana the name *sacapari* was given for this plant."

41339. CARICA sp. Papayaceæ.

"(No. 2053. July 22, 1915.) Seeds of a *papaya* tree of nearly the same size and general appearance as the familiar type, but with the fruits much smaller and more deeply grooved. The flesh is inferior in texture to that of the ordinary *papaya*, but greatly superior in odor and taste, and probably also in keeping qualities. A thoroughly ripened fruit was kept for two weeks under ordinary living-room conditions and still showed no sign of decay. The tree has a more rounded and compact leaf crown than *Carica papaya*, the leaves having much shorter petioles. Another apparent difference is that the fruits are not so closely confined to the leafy portion of the trunk, but are borne well down on the stem. Fruit 9 to 11 cm. long by 5.5 to 7 cm. wide, with flesh 1 cm. or less in thickness, rather tough and elastic, though becoming somewhat softened and turning yellowish with maturity. The odor is very delicious, like a high-grade, well-ripened muskmelon, and the flavor also is excellent, the deficiency lying in the texture of the flesh. The seeds have the taste of capers. As the species appears to be a rather close relative of *Carica papaya*, crossing seems likely to succeed, and if the good flavor and the keeping qualities of the Peruvian species can be combined with the large size and abundant fruiting of *C. papaya* a really acceptable melon tree would result. The *papaya*, improved by the addition of a more attractive flavor and better keeping qualities, might become an important commercial fruit, for it thrives in southern Florida, and commercial production on a larger scale would be feasible there and perhaps also in the warm districts in southern California. From the standpoint of ease of production few plants are more promising than

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

the *papaya*. The trees grow with great rapidity and are extremely prolific. It is known that superior varieties can be propagated asexually, both by budding and by rooted cuttings."

See Circular No. 119, Bureau of Plant Industry, for methods of propagation.

41340. CHENOPODIUM QUINOA Willd. Chenopodiaceæ. Quinoa.

"(No. 2154. Cuzco, Peru, July 27, 1915.) Seeds of a large pigweed extensively cultivated in the high plateaus of Peru. The seeds are eaten prepared in various ways, but the principal use is for making a kind of *chicha*, or native beer. Before the introduction of barley and wheat from Spain, *quinoa* and *cañihua* were probably the only seed crops grown in the more elevated parts of Peru. Potatoes are always the principal crop, with *quinoa* and *cañihua* next, following with the other tubers, *oca*, *anyu*, and *ullucu*. *Quinoa* presents many color variations in the plants as well as in the seeds, especially in the direction of reds and purples. The colored seeds are used almost exclusively for making *chicha*, the white seeds being preferred for eating. A possibility of utilizing the *quinoa* in the United States lies in its use as a breakfast food. Some pronounce it as good as oatmeal, and one resident Scotchman even insisted that it was better. From a crop standpoint, too, the plant appears rather promising, being very vigorous and productive. It is of erect habit, has a strong central stalk, and forms compact heads, heavy with seed. There is no reason why it should not be gathered and thrashed by machinery."

For an illustration of the quinoa, see Plate V.

41341. CYPHOMANDRA CALYCINA Sendt. Solanaceæ. Tree tomato.

"(No. 2058. Seeds from Ollantaytambo, Peru, July 29, 1915.) The plant attains a height of 4 to 5 feet with a single erect central stalk and spreading horizontal branches like a small, flat-topped tree. The leaves are entirely different from those of the tomato, being simple, entire, and broadly oval. The surface of the leaves, as well as the petioles and branches, is covered with a very short, minute, soft, velvety pubescence. The method of branching is peculiar, as there appear to be two leaves on some of the joints, those above the inflorescence, while the other internodes have a single leaf. The buds are tinged with purplish pink, but the mature flowers are nearly white. The fruits have a pointed oval or fusiform shape and are borne in pendent clusters from near the ends of the branches. The largest fruits found in the market of Cuzco measured 7 by 5 cm. The largest diameter is somewhat below the middle of the fruit, the end being more pointed than the base. The colors are Brazil red on the more exposed surfaces and cadmium orange on the lighter parts, with many intermediate shades either in solid color or finely mottled. The skin is thicker and tougher than that of the tomato and the outer layer of flesh firmer. The placenta is large and fleshy, completely filling the interior of the fruit, the seeds being confined mostly to a narrow zone between the outer walls and the placenta. The freshly cut fruit has a pronounced odor, as strong or stronger than that of the tomato, but of a somewhat different quality. The taste, while much nearer to that of the tomato than to any other fruit, is distinctly different. Some might find it more pleasant and others not. In any event the fruit is distinctly edible, and the plant laden with its fruits is curious enough to be grown for its own sake and to allow the possibilities of the fruit to be tested. The habits

41316 to 41341—Continued. (Quoted notes by Mr. O. F. Cook.)

of the plant in Peru indicate that it will grow in a colder climate than the tomato. The natives plant their seed beds (huambales) in July or August and transplant in December, the plants making a very rapid growth during the wet summer months from December to March and ripening their crop in the fall. In the United States the growing period could probably be much shortened, on account of our warmer weather in the spring. The Indians wet the earth with boiling water before planting the seed, to kill or drive away insects that might otherwise attack the young seedlings. They also enrich the soil with sheep or guinea-pig manure. In Urubamba Valley this plant has no other name than *tomate*, which it shares with the true tomato, but this causes no confusion, for the *Cyphomandra* is confined to the higher elevations and *Lycopersicon* to the lower valleys."

41342 to 41356. TRITICUM spp. Poaceæ.**Wheat.**

From Pusa, India. Presented by Mr. Bernard Coventry, Imperial Economic Botanist, Pusa, India, through the superintendent, Agricultural College Farm, Poona, India. Seed received October 4, 1915.

41342 to 41344. TRITICUM DURUM Desf.**41342.** *Hansia Broach.***41344.** *Shet Parner.***41343.** *Potia Nadiad.***41345 to 41350. TRITICUM AESTIVUM L.**
(*Triticum vulgare* Vill.)**41345.** *Mundi of Ludhiana.***41348.** *Popatia Nadiad.***41346.** *Paman of Sirsa.***41349.** *Siok.***41347.** *Daudkhani, or Daudakhani.***41350.** *Deshi Athani.***41351 and 41352. TRITICUM DURUM Desf.****41351.** *Kopergaon Bazi, or Koper-gum Bazi.***41352.** *Black-awned Athni.***41353. TRITICUM AESTIVUM L.**
(*Triticum vulgare* Vill.)*Lal of Batala or Lal of Batalu.***41354. TRITICUM DURUM Desf.***Bansi of Baleghat, or Bansi of Buleghat.***41355 and 41356. TRITICUM AESTIVUM L.**
(*Triticum vulgare* Vill.)**41355.** *Australian.***41356.** *Pivla pote.***41357 to 41360. CASTANEA PUMILA × CRENATA. Fagaceæ.****Hybrid chestnut.**

Produced by Dr. Walter Van Fleet at Little Silver, N. J. Quoted notes by Dr. Van Fleet.

Plants growing at the Plant Introduction Field Station, Chico, Cal.

"A hybrid between the American chinkapin and the Japanese chestnut. Bears at one to three years from seed. A good producer and quite resistant to the chestnut-bark fungus. Nuts large, of fair quality, with rather hard shells."

41357. "The nuts are somewhat larger than ordinary American chestnuts and somewhat sweeter."

41457 to 41360—Con. (Quoted notes by Dr. Walter Van Fleet.)

41358. "Much the same as S. P. I. No. 41357; possibly slightly better in flavor and tenderness of flesh."

41359. "Trees of this number bear much larger nuts than those of either of the two preceding. The nuts are much larger than the American type, about the size of a Spanish chestnut, and are very sweet."

41360. "Tree 26. These are nuts of high quality, much the same in size and flavor as S. P. I. No. 41359."

41361 to 41371. DIOSPYROS KAKI L. f. Diospyraceæ. Persimmon.

From Okitsu, Japan. Cuttings presented by Prof. Ishiware, Horticulture Experiment Station. Received October 9, 1915.

Numbered from 1 to 10; also one package of mixed numbers.

41372 to 41383.

From Poona, Bombay, India. Cuttings presented by Mr. W. Burns, Economic Botanist, Agricultural College. Received October 9, 1915.

41372 to 41376. *OPUNTIA* spp. Cactaceæ. **Prickly-pear.**

41372. *OPUNTIA* sp.

41373. *OPUNTIA DILLENII* (Ker-Gawler) Haworth.

41374 and 41375. *OPUNTIA* spp.

41376. *OPUNTIA ELATIOR* Miller.

41377. *NOFALEA COCHENILLIFERA* (L.) Salm-Dyck. Cactaceæ.

Cochineal cactus.

"A cactus with fleshy, obovate, unarmed branches, native of Mexico, but cultivated on a large scale, especially in the Canary Islands, for cochineal breeding. This is not the only plant which is suited for this purpose; there are several other kinds, characterized by unarmed branches, used for the same purpose; the reason for the choice of this is obvious, because the workmen are not injured by spines. Cochineal, the well-known, splendid, very brilliant color, is produced from the bodies of the scale insect (*Coccus cacti*), killed by means of steam. Since the development of the aniline-dye industry this branch of agriculture, which was extremely profitable to the above islands, has gone down and become practically unremunerative." (*Engler and Prantl, Pflanzenfamilien.*)

41378 to 41383. *OPUNTIA* spp. Cactaceæ. **Prickly-pear.**

41378. *OPUNTIA FILIPENDULA* Engelm.

41379 to 41381. *OPUNTIA* spp.

41382. *OPUNTIA DECUMANA* (Willd.) Haworth.

41383. *OPUNTIA FICUS-INDICA* (L.) Miller.

41384. ANNONA sp. Annonaceæ.

Seeds from Cajabon, Guatemala. Presented by Mr. Walter F. Curley. Received October 7, 1915.

"*Tzumuy Pac*, so called here in the Indian language. I had never seen them until some Indians brought them in; they say they are quite common on the mountain of Chaal near the British Honduras border. They are quite small, yellow outside with corrugated skin, and resemble the larger fruit *sincuya* (*Annona purpurea*). There is very little inside to eat, but that is of fine flavor. The seeds are very abundant. Ripens in the district of Cajabon, Guatemala, in September." (*Curley.*)

41385. FERONIELLA LUCIDA (Scheff.) Swingle. Rutaceæ.*(Feronia lucida Scheff.)*

Seeds from Bultenzorg, Java. Presented by the director of the Botanic Garden. Received October 2, 1915.

"*Kavista batu*. Small spiny tree, native to Java; leaves odd-pinnate, 3 to 6 paired; leaflets oval or obovate, coriaceous, shiny above, margins entire or slightly crenulate, obtuse or emarginate at the apex; petioles pubescent, the terminal leaflet sessile; rachis pubescent, articulated; flowers perfect or by abortion male, fragrant, white, rather large; sepals small, linear, pubescent; petals pointed oval; stamens four times as many as the petals; fruit globose, 2½ to 2¾ inches in diameter; seeds small, with a thin hard testa, immersed in the glutinous pulp. The pulp is sometimes eaten in Java, like that of the wood-apple (*Feronia limonia*). It grows wild in the drier parts of Java, and has been introduced into the United States, where it is being tested by the Department of Agriculture as a stock for citrus fruits." (W. T. Swingle. In *Bailey, Standard Cyclopedia of Horticulture*, vol. 3, p. 1220.)

41386 to 41388. CITRUS spp. Rutaceæ.

Seeds from Manila, Philippine Islands. Presented by Mr. P. J. Wester, Linao Experiment Station. Received October 4, 1915.

41386. CITRUS MEDICA L.**Citron.**

"A small primitive citron." (Wester.)

41387. CITRUS SOUTHWICKII Wester.**Limao.**

"(No. 2049.) *Limao*. A thorny tree, with dense head and drooping branches, attaining a height of 6 meters. The *limao*, though rare, is not uncommon in Bohol, where it is cultivated, and it has also been collected by the writer in Baganga, Mindanao. The flowers appear late in April and during the early part of May, with the fruit ripening in January and February. A few fruits nearly full grown were collected in May. This plant has flowered irregularly from May to December. The fruit is not eaten, but is used in washing by the Boholanos. It is of no economic importance. The tree is evidently quite drought resistant and succeeds well in very scanty soil underlain with limestone. The *limao* belongs in that group of the citrus fruits having free filaments, the most conspicuous characters being the compact growth of the crown, the dark-green, thick, and distinct leaves, the almost sessile stigma, and the attractive, oblate, regular-shaped fruit with its many locules, exceeding in number those in any other citrus fruit known to the writer. This species has been named in honor of Mr. E. F. Southwick. For a full description, see *The Philippine Agricultural Review*, first quarter, 1915. Fruits scarcely edible; plant may make a good stock." (Wester.)

41388. CITRUS WEBBERII MONTANA Wester.**Cabugao.**

"(No. 2266.) *Cabugao*. Seeds from plant from which this species was described. Fruit makes a fair ade." (Wester.)

"A shrubby tree with slender branches and small, weak spines, sometimes absent; young growth green; leaves 8.5 to 14 cm. long, 3 to 3.5 cm. broad, ovate to ovate-oblong, crenate, dark green above, shining, base broadly acute to rounded, apex blunt pointed, usually retuse; petiole 24 to 38 mm. long, with narrow wing margin, in large leaves sometimes 17 mm. broad; flowers not seen; fruit roundish oblate, about 45 mm. across, somewhat corrugate, 8-loculed. The general character of the plant and fruit indicates that the *cabugao* is a form of the *alsem* (*Citrus webberii*)." (Wester *The Philippine Agricultural Review*, vol. 8, p. 14, first quarter, 1915.)

41389 and 41390. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)

Seeds from Smyrna, Turkey. Presented by Mr. George Horton, American consul general. Received October 9, 1915.

41389. "Freestone peaches, grown in the Vilayet of Aidin." (*Horton.*)

41390. "Clingstone peach, grown in the Vilayet of Aidin." (*Horton.*)

41391. HOMOIOCELTIS ASPERA (Thunb.) Blume. Ulmaceæ.
(*Aphananthe aspera* Planch.)

Seeds from Augusta, Ga. Presented by P. J. Berckmans Co. Received October 5, 1915.

An ornamental ulmaceous tree up to 60 feet high, having the appearance of a hackberry (*Celtis occidentalis*), with the slender branches forming a dense head. Leaves ovate to ovate-oblong, broadly wedge shaped at the base, tapering at the apex, 2 to 3½ inches long, serrate, with straight veins ending in the teeth. (This last character easily distinguishes this tree from *Celtis sinensis*, with which it has often been confused.) The greenish flowers and small black drupes are inconspicuous. Not hardy north of Georgia. (Adapted from *Rehder*. In *Bailey, Standard Cyclopedia of Horticulture*, vol. 1. p. 308.)

41392. UVARIA CALAMISTRATA Hance. Annonaceæ.

Seeds from Hongkong, China. Presented by Mr. W. J. Tutcher, superintendent, Botanical and Forestry Department. Received October 11, 1915.

"A native of Hongkong. This is a strong-growing creeper which produces an edible fruit of a very pleasant, slightly acid taste." (*Tutcher.*)

41393. LICANIA PLATYPUS (Hemsl.) Fritsch. Rosaceæ. Sansapote.

Seeds from San Jose, Costa Rica. Presented by Mr. Carlos Wercklé, Department of Agriculture. Received October 14, 1915.

"Inferior to the species from the Atlantic coast, as it has little flesh; large fruits still sell even here in Orotina, 1½ leagues from where it grows wild, for 5 cents upiece, and smaller ones two for 5 cents. One of the most beautiful of all forest trees; of gigantic size; timber nearly as good as Cedrela." (*Wercklé.*)

41394. BELOU MARMELOS (L.) Lyons. Rutaceæ. Bael.
(*Aegle marmelos* Correa.)

Seeds from Lahore, India. Presented by the superintendent Government Agriculture-Horticulture Gardens. Received October 14, 1915.

See S. P. I. Nos. 38664, 41002, and 41133 for previous introductions.

41395. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)

Seeds from Kiayingchow, Swatow, China. Presented by Rev. George Campbell, through Mr. George C. Hanson, American consul, Swatow, China. Received October 11, 1915.

"Peach pits from a curious little tree grown here only in pots as a house plant. The leaves are like other peach leaves, but its manner of growth is quite different. This particular tree is now just 15 inches high and had five full-sized peaches, somewhat smaller than American ones. I broke off two or three other fruits when quite small. They are borne on the main trunk on stems about a quarter of an inch long and make one think of papayas. The

lowest was 6 inches from the earth of the pot and the highest 8 inches, so the five were closely crowded together. The trunk at this point is little, if any, larger than a lead pencil. The fruit is of good color, as Chinese peaches go, and taste better than any others I have eaten in China. The flesh is white and it clings to the pit. The fruit hangs on the tree a very long time and is quite ornamental. The blossoms are quite showy, too. The Chinese say it comes true from the pits. I picked the last one yesterday, and the first was ripe a month ago. The ordinary peaches here are very poor—not fit to eat unless cooked.” (*Campbell*.)

For an illustration of this peach, see Plate VI.

41396 to 41400. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)

Seeds from Barcelona, Spain. Presented by Mr. Carl Bailey Hurst, American consul general. Received October 14, 1915. Quoted notes by Mr. Hurst.

“The peach tree of Spain is said to be of Persian origin and its numerous varieties as found here to-day may be divided into four classes—the common peach, or *Albérchigo*, the fruit of which has a yellow and red skin; the *Abridor*, the fruit of which has white, tender flesh; the *Pare*, the fruit of which is fine and succulent, and the *Bruñón*, the fruit of which has a hard flesh and strong, tenacious skin. From these four kinds 44 varieties have been developed. Those most cultivated here are divided into two groups, those planted in the spring and those planted in the fall. The spring peaches, which ripen in June and July, are known as *temprano*, or early, the varieties of which found chiefly here are *Magdalena Rojo*, *De Malta*, *Canciller*, and *Valenciano*. Seeds of the fall peaches known as *tardío*, or late, can not be had at present in any of the peach stores of Barcelona.

“Spanish peach trees are planted in well-fertilized soil, the depth varying according to the quality and nature thereof and local weather conditions. A piece of bone is placed at the bottom of each hole made in the soil before planting. From the experience of local horticulturists it has been found that the use of a mixed vegetable and animal fertilizer is best adapted to the growth of the young peach trees. The earth around the planted tree should be worked frequently. The planting of peach trees too close to garden or other walls is found to be highly prejudicial to their development, and in transplanting they should be placed not nearer than 1 foot away. During the first three or four years much attention is devoted to the pruning of Spanish peach trees, in order to develop symmetric growth and enable the sap to distribute itself proportionately in all parts. Argillaceous or very cretaceous soil is not found advantageous to peach culture here, as in such soil the roots can not extend freely. If the soil be too damp, the fruit becomes insipid and matures late. Where the soil is sandy the fruit produced is more aromatic, but less juicy. The soil preferred for peach culture in Spain is a turfy mellow loam of a calcareous nature. The seed of the cultivated peach is very rarely planted here, as the growth of the tree is so slow that four years are required to produce fruit. When, however, it is planted by the nurseryman, it is usually done in the month of March. The Spanish horticulturist prefers to plant a wild-peach seed which grows rapidly and gives at the end of a year a stock upon which a cultivated peach bud may be grafted. The budding is generally done in August, but may also be performed in May or September. The incision is made from 4 to 6 inches above the ground. Preferable here to grafting on the wild-peach stock is grafting the cultivated peach on the almond or cherry

stock, which is stronger and not so susceptible to climatic changes. Fruit is obtained sooner and the life of the tree lengthened, because the peach tree does not usually live more than 8 to 10 years here. For this reason the almond is preferred to the cherry, although both are adapted to this purpose, as they grow rapidly and are long lived."

41396. "No. 1. Wild peach."

41397. "No. 2. *Magdalena Rojo*. This peach is the fruit of a vigorous tree which produces abundantly. The peaches are large, the skin is highly colored, while the flesh is white streaked with red. It is sweet and very fragrant and the stone is easily separated. This peach matures by the end of August."

41398. "No. 3. *De Malta*. This peach grows abundantly on a strong tree, is of medium size with white flesh, and matures by the middle of August."

41399. "No. 4. *Canciller*. This peach is large and of fine appearance. Its flesh is firm, and it ripens by the end of August."

41400. "No. 5. *Valenciano*. This variety is a medium-sized fruit, with reddish tinged flesh, which grows on a strong tree that produces abundantly."

41401. *ACTINIDIA CHINENSIS* Planch. Dilleniaceæ. **Yangtaw.**

Seeds from Yencheng, Kiangsu, China. Presented by Rev. Hugh W. White, American Presbyterian Mission, South. Received October 14, 1915.

See S. P. I. Nos. 21781, 30196, and 33431 for previous introductions and descriptions.

41402. *TRITICUM DURUM* Desf. Poaceæ. **Durum wheat.**

Seed from Buenos Aires, Argentina. Presented by the Ministerio de Agricultura. Received October 2, 1915.

"Commonly known as *Candeal*, a name which commercially covers all durum wheats grown in this country. Although we have no division of winter and spring wheats, we would classify this particular variety under the second heading." (*Sr. Guillermo Ancizar.*)

41403 to 41417.

Seeds from Bhutan, India. Collected by Mr. R. E. Cooper and presented by Bees (Ltd.), Liverpool, England, at the request of Mr. A. K. Bulley. Received October 14, 1915. Quoted notes by Mr. Cooper.

41403. *SWERTIA* sp. Gentianaceæ.

"No. 4157. Only seen in fruit, scarce, growing in moist sand and gravel at an altitude of 12,000 feet on a bare hillside."

41404. *PRIMULA* sp. Primulaceæ. **Primrose.**

"No. 4164. Preferring moist sand on exposed hillside or peat marsh under Abies forest at altitudes of 10,000 to 12,000 feet. Leaves glabrous, reticulate. Inflorescence of superposed umbels, most variable, from a head of three flowers to three umbels. Mixed seed from all sorts of plants. Flowers not seen, but suspected to be small, yellowish."

41405. *HYDRANGEA* sp. (?) Hydrangeaceæ.

"No. 4165. Bush under Acer forest at an altitude of 10,000 feet. Four feet high with showy bright-blue bracts on large heads."



THE QUINOA, AN IMPORTANT "GRAIN" PLANT OF THE ANDES (*CHENOPODIUM QUINOA* WILLD.), S. P. I. No. 41340.

This is one of the most useful plants in the mountain regions of Peru and Bolivia, the extremely small seeds of the white variety being cooked with potatoes to make a staple dish among the lower classes. Dark-colored seeds are used almost entirely for making chicha, or native beer. Before using, it is necessary to wash the seeds thoroughly in order to eradicate a bitter flavor which they possess. The value of this plant in the United States lies in its possibilities as a breakfast food. (Photographed, natural size, by the Yale University-National Geographic Society Expedition; P17780CA.)



A CHINESE DWARF PEACH FOR PLANT BREEDERS (*AMYGDALUS PERSICA*), S. P. I.
No. 41395.

Although dwarf peaches such as the Dwarf Orleans have long been known and little use made of them, a new dwarf from China, the home of the peach, may not be without interest, particularly to breeders. This variety, sent in by Rev. George Campbell, of Kiayingchow, near Swatow, produced seven fruits when only 15 inches high. They were white clingstones of a good quality and quite ornamental, and were borne close to the trunk, which was about the size of a lead pencil. It is said to come true to seed. (Photographed by Mr. Peter Bisset in 1916 from seed planted at Chico, Cal., in October, 1915; P20612FS.)

41403 to 41417—Continued. (Quoted notes by Mr. R. E. Cooper.)**41406. PRIMULA sp. Primulaceæ.****Primrose.**

"No. 4166. Only seen in fruit, but allied to if not *Primula obtusifolia*; preferring peaty soil under shade of Abies forest, along stream edges at altitudes of 12,000 to 13,000 feet."

41407. IRIS sp. Iridaceæ.**Iris.**

"No. 4190. Growing under oak forest at an altitude of 8,000 feet, only seen in fruit and suspected of being only half hardy, but growing in dry situations on slopes that are snowed under in winter. May prove all right."

41408. PRIMULA PETIOLARIS Wallich. Primulaceæ.**Primrose.**

"No. 4213. Growing under rhododendrons at altitudes of 10,000 to 11,000 feet, in moss, on rocks, trees, etc. Not seen in flower. Inflorescence stalked."

41409. PRIMULA PETIOLARIS Wallich. Primulaceæ.**Primrose.**

"No. 4214. Growing in similar situations as S. P. I. No. 41408 and differing only in the sessile inflorescence *a la Primula winteri*. Flowers not seen."

41410. PRIMULA sp. Primulaceæ.**Primrose.**

"No. 4217. Suspected of being *Primula whitei* W. W. Smith, growing under rhododendron scrub at an altitude of 10,000 feet in moss on boulders by stream. Never in actual swampy peat by water. Flowers dark blue, yellow eye, in a head often of 12 to 20 flowers."

41411. PRIMULA MOLLIS Nutt. Primulaceæ.**Primrose.**

"No. 4227. Growing in sodden leaf soil in undergrowth of *Elatostema* on slope facing north at an altitude of 7,000 feet. Not hardy. Flowers not seen."

41412. PRIMULA OBTUSIFOLIA Royle. (?) Primulaceæ.**Primrose.**

"No. 4270. Var. *lutea*. Flowers yellow with golden-eye, harsh scented, growing in profusion in peaty alpine meadows at an altitude of 14,000 feet."

41413. TAMARIX sp. Tamaricaceæ.**Tamarisk.**

"No. 4283. Scrubby plant with spike of heather-colored flowers, growing on gravel by a stream in the bed of a glacial valley at an altitude of 12,000 feet. Plants 6 inches to 1 foot high, in masses; fruits woolly."

41414. MECONOPSIS sp. Papaveraceæ.

"No. 4293. Allied to *Meconopsis simplicifolia*; only seen in fruit among dwarf rhododendrons at an altitude of 13,000 feet. Fruit peculiarly round, differing in this from usual long fruits of *Meconopsis simplicifolia*."

41415. PINGICULA sp. Pinguiculaceæ.**Butterwort.**

"No. 4311. Only seen in fruit, growing in moist peat by a stream in an alpine meadow at an altitude of 12,000 feet."

41416. PRIMULA sp. Primulaceæ.**Primrose.**

"No. 4330. Same as S. P. I. No. 41404, but seed selected from plants with only two or three tiers of fruits."

41417. BRYOCARPUM HIMALAICUM Hook. f. and Thoms. Primulaceæ.

"No. 4332. Flowers yellow, solitary, growing in moss, etc., under Abies forest at an altitude of 11,000 feet."

41418. OCOTEA sp. Lauraceæ.

Seeds from San Jose, Costa Rica. Presented by Mr. Carlos Wercklé, Department of Agriculture. Received October 9, 1915.

41419. AMYGDALUS PERSICA L. Amygdalaceæ.**Peach.**

(*Prunus persica* Stokes.)

From Naples, Italy. Presented by Mr. Jay White, American consul. Received October 19, 1915.

"Seeds of a variety of clingstone peach known as the *Pesca-Cotogna*, and locally as the *Percoca*. The peach of this variety is a large, hard, yellow fruit, all of which characteristics are suggested by its name, which is literally the 'peach-quince.'" (*White*.)

41420. PROTEA ARGENTEA L. Proteaceæ.**Silver tree.**

(*Leucadendron argenteum* R. Br.)

Seeds from Lawang, Java. Presented by Mr. M. Buysman, Botanic Garden. Received October 18, 1915.

"The *Silver* tree of South Africa, the leaves of which plant are used for various purposes and contain proteasein, used in cases of malaria." (*Buysman*.)

"*Witteboom*, a beautiful tree, native only in the immediate neighborhood of Cape Town. It is a small tree, up to 50 feet in height and 12 to 18 inches in diameter, with verticillate branches and white silky foliage which render its name appropriate and make the tree visible from a distance. Leaves widely lanceolate, 3 to 7 inches long, softly coriaceous, entire, acute. The soft, silky white leaves are now an article of commerce, being salable as curios, bookmarks, mats, fancy articles, etc., especially as when dried they take writing, painting, etc., and are then sold with texts or names inscribed or small scenes depicted. An export trade in these exists, as also in leaves for everlasting bouquets. The tree seldom attains maturity, on account of the constantly recurring fires, but where seedling is allowed these fires appear to assist germination and are followed by dense regrowth which would not otherwise appear. The limited distribution of this tree and its great abundance over that area where it has practical possession are very remarkable. In cultivation elsewhere there is little difficulty in securing germination, and if it does not damp off during the early stages it may continue to grow up to cone-bearing stage in 10 to 15 years, but seldom attains the size or vigor it has on Table Mountain, and nowhere has it shown any tendency to become naturalized." (*Sim, The Forests and Forest Flora of Cape Colony*, p. 294.)

41421 to 41423. AMYGDALUS PERSICA L. Amygdalaceæ.**Peach.**

(*Prunus persica* Stokes.)

Seeds from Shanghai, China. Presented by Mr. C. E. Gauss, American consul. Received October 16, 1915. Quoted notes by Mr. Gauss.

"Peaches are grown in the Zicawei district of Shanghai and are of two general types, viz, the round peach and the flat peach. It is said that the peaches sold in Shanghai must necessarily come from within a radius of about 20 miles, due to the fact that there are no cold-storage facilities in China. Nevertheless peaches grown in Chefoo, Hangchow, and Ningpo are to be found on the Shanghai market. These, however, are said to be picked while green and allowed to ripen during the period of transportation."

41421 to 41423—Continued. (Quoted notes by Mr. C. E. Gauss.)

41421. "*Mi t'ao*, meaning 'sweet peach,' is round in shape, as is also the seed. Its appearance is not very nice, as it has many blemishes, but it tastes very sweet and is more expensive than *Pien t'ao* [S. P. I. No. 41422]."

41422. "*Pien t'ao*, meaning 'flat peach.' This peach is larger in size and looks much better than the *Mi t'ao* [S. P. I. No. 41421], but does not taste as sweet." A sample of the seed shows that it is the ordinary peach and not the flat variety.

41423. (No notes.)

41424 and 41425.

Seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Co. Received October 18, 1915.

41424. CUCURBITA PEPO L. Cucurbitaceæ. Japanese squash.

Chirimen. A round, orange-red, deeply scalloped squash of good flavor.

41425. PRUNUS SERRULATA SACHALINENSIS (Schmidt) Makino. Amygdaceæ. *Sargent's cherry*. (*Prunus sargentii* Rehder.)

Yama zakura, from Hokkaido.

41426. CHAYOTA EDULIS Jacq. Cucurbitaceæ.

Chayote.

(*Sechium edule* Swartz.)

Fruits from San Jose, Costa Rica. Presented by Mr. Carlos Wercklé, through Mr. J. E. Van der Laat, director, Department of Agriculture. Received October 21, 1915.

"*Fiberless cocoros*. Very small, entirely coreless, and fiberless. I do not know whether the seeds of all the fruits are without testa, but the only one that I could examine was so; simply the cotyledons in a very small cavity in the center, without a shell." (*Wercklé*.)

41427. CORYLUS COLUMNATA L. Betulaceæ.

Turkish hazel.

Seeds from Rochester, N. Y. Presented by Mr. Richard E. Horsey, Highland Park, at the request of Mr. C. A. Reed, of the Bureau of Plant Industry. Received October 19, 1915.

"*Constantinople hazel*. This hazel is the one which grows to be a large tree. One of the specimens in the park at Rochester measured 58 inches in circumference 1 foot above the ground." (*C. A. Reed*.)

"A tree up to 80 feet high, with a trunk sometimes 7 feet in girth, covered with pale scaling bark; leaves 2½ to 6 inches long, 2 to 4½ inches wide; broadly heart shaped, coarsely double toothed or almost lobed; fruits in clusters of three or more, the husks 1½ inches wide, with narrow-pointed fringed lobes 1 inch long; nuts one-half to five-eighths of an inch in diameter. (Adapted from *W. J. Bean, Trees and Shrubs Hardy in the British Isles*, vol. 1, p. 401.)

See S. P. I. No. 2212 for previous introduction.

41428. OPUNTIA NIGRICANS Haworth. Cactaceæ. Prickly-pear.

From Sydney, New South Wales. Cuttings presented by Mr. J. H. Maiden, director, Botanical Gardens. Received October 22, 1915. No. 144.

41429. MERATTIA PRAECOX (L.) Rehder and Wilson. Calycanthaceæ.
(*Chimonanthus fragrans* Lindl.)

Seeds from China. Presented by Mr. N. Gist Gee, Soochow University, through Mr. R. Rathbun, United States National Museum. Received October 19, 1915.

"Chinese *La mei hua*, rather rare. Make good flowering plants." (Gist Gee.)

"A deciduous shrub, naturally about 8 feet high, and of compact, bushy habit, but growing considerably higher on walls. Leaves lanceolate, 2 to 5 inches long, dark lustrous green. Flowers exceedingly fragrant, produced at various times between November and March according to the weather, but in ordinary seasons at their best in December against a wall; they are solitary on very short stalks at the joints of the previous summer's shoots, three-fourths to 1 inch across, the sepals and outer petals of an almost transparent yellowish green, the inner petals smaller and purplish. Seeds produced in a stalked gourd-shaped structure 1½ inches long, to the apex of which the stamens remain attached." (W. J. Bean, *Trees and Shrubs Hardy in the British Isles*, vol. 1, p. 337.)

41430. ALEURITES FORDII Hemsl. Euphorbiaceæ. Tung tree.

From Pineville, La. Seeds presented by Mr. William Hammond, superintendent, Alexandria National Cemetery. Received October 19, 1915.

"This seed came from the largest tree on the grounds, situated immediately in front of the lodge (west gate), and as there is and has been a flower bed around its base that has been irrigated regularly I attribute its larger size to that, although the water would not penetrate deeply." (Hammond.)

41431. BACCAUREA SAPIDA (Roxb.) Muell. Arg. Euphorbiaceæ.

Seeds from Rangoon, Burma, India. Presented by Rev. William H. S. Hascall.

"*Kan-a-so-thi* or *Pierardia*." An evergreen tree, native of the Malay Archipelago, 40 to 50 feet high, with alternate, rather membranous leaves 4 to 8 inches long; inconspicuous diœcious flowers in racemes, and yellow, slightly hairy fruits from three-fourths to 1 inch long. The bark is one of the chief mordants employed in using cotton dyes in India. (Adapted from Hooker, *Flora of British India*, and Watt, *Commercial Products of India*.)

41432 to 41443.

Seeds from Kamerunga, via Cairns, Australia. Presented by Mr. J. A. Hamilton. Received October 18, 1915. Quoted notes by Mr. Hamilton, except as otherwise indicated.

41432. ALBIZZIA ODORATISSIMA (L. f.) Benth. Mimosaceæ.

See S. P. I. Nos. 38996 and 39103 for previous introductions and description.

41433. ANNONA MURICATA L. Annonaceæ. Soursop.

See S. P. I. Nos. 32302 and 35285 for previous introductions and descriptions.

41434. CANAVALI OBTUSIFOLIUM (Lam.) DC. Fabaceæ.

"Native bean. It is not edible so far as I know. The flowers are sweetly scented and come out singly. It might cross with the *Mauritius* bean and make a good cover crop, for it seems to stand drought and heat well."

41432 to 41443—Contd. (Quoted notes by Mr. J. A. Hamilton.)

"The seeds are eaten by the blacks after cooking, as they are poisonous in the raw state. Some shipwrecked sailors in northwestern Australia were poisoned by them." (*Forrest. In Maiden, Useful Native Plants of Australia.*)

41435. CARICA PAPAYA L. Papayaceæ.

Papaya.

"*New Era papaya.*"

41436. CITRUS sp. Rutaceæ.

Orange.

"*Kamerunga seedling orange*; A 1, very sweet; in fact, has a minimum of acid."

41437. DIOSCOREA sp. Dioscoreaceæ.

Yam.

"Seeds of native yam; they are wild *kaikai* (native food), and no attempt has ever been made to cultivate them."

41438. FICUS BENJAMINA L. Moraceæ.

Weeping fig.

See S. P. I. No. 18734 for previous introduction and description.

41439. LYCOPodium sp. Lycopodiaceæ.

Club moss.

Spores.

41440. MUSA HILLII F. Mueller. Musaceæ.

Wild banana.

"The fruit is not edible, being full of seeds, but as the flowers evidently produce pollen, they might be useful to carry out experiments in hybridization. The plants are prolific enough, there being about 200 fruits on the bunch this seed came from."

41441. PLATYCERIUM GRANDE J. Smith. Polypodiaceæ.

Fern.

"The glory of the genus, however, is *Platycerium grande*. The barren fronds are exceptionally large, rounded and wavy margined at the base, deeply cut above, forming an erect or arching background to the pendent fertile fronds, which fork more times and have much narrower segments than the barren fronds. Unfortunately this is the only species that does not produce suckers at the roots, by which all the others are easily propagated. It alone must be raised from spores, a long and anxious process." (*L. H. Bailey, Cyclopedia of American Horticulture, vol. 3, p. 1369.*)

Spores.

41442. RUBUS sp. Rosaceæ.

Wild raspberry.

"Wild raspberry. Likes moist situations. Growing near a spring in decomposed, yellowish red, sandy shale, latitude 17° 30' S., 100 feet above sea level."

41443. ZIZIPHUS MAURITIANA Lam. Rhamnaceæ.

Indian jujube.

(*Ziziphus jujuba* Lam., not Miller.)

"*Tag bush, or Chinese-apple.* Rather ornamental if trained as a standard. Very good for a hedge."

"The Indian jujube. Lisboa observes that it is one of the commonest fruit trees of the villages of western India. A moderate-sized deciduous tree, 'distinctly wild in the forests of the Siwaliks and sub-Himalayan tracts of the Punjab and United Provinces, and also in the Deccan and in Upper Burma and Ceylon in dry forests. Elsewhere mostly cultivated or run wild.'" (*Gamble, A Manual of Indian Timbers.*)

"The bark is said to be used for tanning in northern India, Bombay, Madras, and Burma. In Chota Nagpur it is similarly employed, but

41432 to 41443—Continued.

along with the fruit. Occasionally it is thrown into indigo vats to aid in precipitating the fecula. Hooper states that a sample of bark from Madras gave 4.1 per cent of tannin, and a sample of thick root examined at Dehra Dun gave 2.6 per cent, while some thin roots afforded 9.3 per cent. Most parts of the tree are employed in native medicine. The fruit of the wild *ber*, which ripens in the cold weather—the cultivated one almost in any season—resembles the crab apple in flavour and appearance and is much eaten, as well as that of most species, by the poorer classes; in fact, in times of scarcity these fruits are especially prized. By cultivation it is greatly improved both in size and flavour, and there is great variety among the cultivated forms. According to Marshall Woodrow, 'the best are elliptical, 2 inches in length by 1 in thickness, and are propagated by inarching or budding on seedlings of the common sort.' The unripe fruit is pickled; the ripe pulp is dried, mixed with salt and tamarinds, to form a condiment, or is made into chutnies. The kernels are also eaten, and the leaves constitute a useful fodder for cattle and goats. The wood is hard and reddish in colour, weighing on an average 48 pounds per cubic foot. It is largely employed in ordinary constructive work and has been recommended for furniture. It is also said to make excellent charcoal." (*Watt, Commercial Products of India*, p. 1143.)

41444 and 41445.

Seeds from Sibpur, near Calcutta, India. Presented by the curator, Royal Botanic Gardens. Received by Mr. W. T. Swingle, October 15, 1915.

41444. ATALANTIA CEYLANICA (Arn.) Oliver. Rutaceæ.

A much-branched spiny shrub or small tree native to Ceylon and India, where it is known as *yakinaran* or *peykurundu*. Chiefly of interest for trial as a stock, since its large seeds would be likely to produce vigorous seedlings. The dry fruit makes it unpromising for breeding purposes. (Adapted from *Swingle*. In *Bailey, Standard Cyclopædia of Horticulture*.)

41445. PLEIOSPERMIUM ALATUM (Wight and Arnott) Swingle. Rutaceæ. (*Limonia alata* Wight and Arnott.)

A small tree, common in southern India and Ceylon, especially in the dry regions; known as *tumpat-kurundu*. The wood is hard and close grained, much like that of *Chalcas exotica*. Of possible value for stocks. (Adapted from *Swingle*. In *Bailey, Standard Cyclopædia of Horticulture*.)

41446. BERBERIS ANGULOSA Wallich. Berberidaceæ. Barberry.

Seeds from Kew, England. Presented by the director, Royal Botanic Gardens. Received October 22, 1915.

A deciduous Himalayan barberry with clustered dark-green leaves, unusually large flowers, and large palatable berries.

See S. P. I. Nos. 33016 and 40143 for previous introductions.

41447 and 41448.

Seeds from Kamerunga, via Cairns, Queensland. Presented by Mr. J. A. Hamilton. Received October 18, 1915. Quoted notes by Mr. Hamilton.

41447 and 41448—Continued.**41447. CAESALPINIA CORIARIA** (Jacquin) Willd. *Cæsalpiniaceæ.***Divi-divi.**

"Divi-divi. Ornamental; the pods used for tanning."

See S. P. I. Nos. 26171 and 35896 for previous introductions.

41448. GOSSYPIUM sp. *Malvaceæ.***Caravonica cotton.**

"Caravonica cotton, originated by Dr. Tomates."

41449. PHYSALIS PERUVIANA L. *Solanaceæ.***Husk-tomato.**

Seeds from Dundas, New South Wales, Australia. Presented by Mr. Herbert J. Rumsey. Received October 21, 1915.

"Cape-gooseberry or Husk-tomato. The last season's crop cast back to purple tinge rather badly, though the fruit was very fine. We are selecting with the object of procuring a set type of yellow fruit, but the purple strain is, we find, hard to eradicate, and though the purple fruit is very fine for show purposes it has not the commercial value of the yellow fruit." (*Rumsey.*)

41450. CITRUS GRANDIS (L.) Osbeck. *Rutaceæ.***Pummelo.**

From Amoy, China. Presented by Mrs. Helen C. Kip. Received October 23, 1915.

"Pomelo seed from Siam or the Straits." (*Kip.*)**41451. ARTOCARPUS COMMUNIS** Forster. *Moraceæ.***Breadfruit.**(*Artocarpus incisa* L. f.)

Seeds from Orotina, Costa Rica. Presented by Mr. Carlos Wercklé. Received October 23, 1915.

"These are as good as chestnuts; 100 seeds to a fruit." (*Wercklé.*)**41452. MEROPE ANGULATA** (Willd.) Swingle. *Rutaceæ.*(*Citrus angulata* Willd.)

Seeds from Calcutta, India. Presented by Mr. C. C. Calder, Royal Botanic Gardens. Received October 23, 1915.

See S. P. I. Nos. 28933, 31353, and 39168 for previous introductions.

41453 and 41454.

Seeds from Saskatoon, Canada. Presented by Prof. T. N. Willing, University of Saskatchewan. Received October 25, 1915. Quoted notes by Mr. Fairchild.

41453. PSORALEA ESCULENTA Pursh. *Fabaceæ.*

"An edible-rooted species of legume, which grows abundantly in Saskatchewan, according to Prof. Willing. The root has been eaten by the Indians for many years and is called the *Cree-turnip*. So far as Prof. Willing knew, its cultivation had never been attempted. It should be grown and a sufficient quantity of seed obtained to experiment with."

41454. SOLANUM TRIFLORUM Nutt. *Solanaceæ.*

"A low-growing species of *Solanum* to which my attention was directed by Prof. Willing. Apparently this is a very heavy-fruited species of *Solanum*, and it is possible that hybrids might be produced between it and one of the species of *Physalis*. It might prove interesting to anyone working with these plants, although it has a rank flavor, resembling that of *Solanum nigrum*."

41455. PRUNUS sp. Amygdalaceæ.**Plum.**

Plants from China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received at the Plant Introduction Field Station, Chico, Cal., May 27, 1914.

"(No. 1193. Plants from Tsaochowfu, Shantung, China, March 11, 1914.) A flowering plum, much liked by the Chinese for forcing purposes. Generally trained in grotesque shapes and always grafted on *Amygdalus davidiana*, as the latter stands drought, transplanting, and neglect better than plums on their own roots. Chinese name *Mei*." (*Meyer*.)

41456. DIOSPYROS KAKI L. f. Diospyraceæ.**Persimmon.**

Scions from Glendora, Cal. Presented by Judge Charles Silent, through Mr. Wilson Popenoe, of the Bureau of Plant Industry. Received October 28, 1915.

"In the fall of 1914, when in California, I visited Judge Silent's place and became interested in this persimmon tree. The young twigs of all the branches were bearing the old pedicels of staminate flowers in great numbers, but after a careful search of the tree I could discover the remains of only three pedicels of pistillate flowers. If this character should hold good (and we have reason to believe it will), we have at last found the long-looked-for male *Kaki* persimmon tree, which should be planted in every orchard of *Kaki* persimmons as a pollinator, for Prof. H. H. Hume has demonstrated that the lack of pollination is the cause of the immature fruits dropping." (*Peter Bisset*.)

41457. CUCUMIS MELO L. Cucurbitaceæ.**Muskmelon.**

From Petrograd, Russia. Seeds presented by Capt. N. A. McCully, naval attaché, American embassy, at the request of Mr. W. P. Cresson. Received October 28, 1915.

"Seeds of a Tashkend *Denia*, a sort of large cantaloupe. At dinner we had one of these melons and it was remarkably good, with a peculiar, delicious flavor different from that of our own cantaloupe or from that of any other that I know. The melons are brought here from the vicinity of Tashkend." (*McCully*.)

41458. BARLERIA CRISTATA L. Acanthaceæ.

Cuttings from Manila, Philippine Islands. Presented by the director, Department of Agriculture. Received November 1, 1915.

"A Philippine hedge plant, the best in the Tropics. I think it never seeds here." (*O. W. Barrett*.)

An erect or diffuse acanthaceous undershrub with the branches and upper surface of the leaves usually downy, with yellow hairs, and with dense, often compound, ovate spikes of purple, blue, or white flowers. The corolla is about 1½ inches long, the upper half funnel shaped and spreading into ovate lobes one-half inch in length. Wild everywhere in the lower hills of northeastern and central India and probably in the mountains of southern India also. (Adapted from *Hooker, Flora of British India*, vol. 4, p. 488, 1884.)

41459. MORUS NIGRA L. Moraceæ.**Mulberry.**

Cuttings from Biggs, Cal. Procured from Mr. F. Haselbusch by Mr. R. L. Beagles to be grown at the Plant Introduction Field Station, Chico, Cal.

"A very large, black, subacid mulberry. Said to be of Russian origin." (*J. E. Morrow*.)

41460. PRUNUS MUME Sieb. and Zucc. Amygdalaceæ.**Japanese apricot.**

Bud sticks from Yuba City, Cal. Obtained from Dr. J. H. Barr by Mr. R. L. Beagles to be grown at the Plant Introduction Field Station, Chico, Cal.

"A very large, spreading tree, bearing dense masses of white flowers. Growth very vigorous. Very beautiful in spring. Fruit edible, but small." (*J. E. Morrow.*)

41461. PYRUS OVOIDEA Rehder. Malaceæ.**Pear.**

Seeds taken from fruit received from the Arnold Arboretum, Jamaica Plain, Mass. Growing at the Plant Introduction Field Station, Chico, Cal.

For propagating and testing.

41462. CASTANEA PUMILA \times CRENATA. Fagaceæ. Hybrid chestnut.

Seedlings from hybrid trees. The parent trees were the result of a cross between the Japanese chestnut and the American chinkapin made by Dr. Walter Van Fleet. Growing at the Plant Introduction Field Station, Chico, Cal.

41463. JUNIPERUS CEDRUS Webb. Pinaceæ. Teneriffe juniper.

Seeds from Teneriffe, Canary Islands. Collected by Dr. George V. Perez and presented through the Royal Botanic Gardens, Kew, England. Received November 1, 1915.

"This valuable tree, which is nearly extinct, is said to be the quickest growing of all junipers. I have carefully watched the growth of some in my garden at Villa Orotava, and can report an average of over 3 feet a year. *Juniperus cedrus* begins to seed here within five years of planting, so that its propagation is easy, at any rate in a suitable climate. If treated in the following manner, it germinates much more promptly and abundantly. The seeds should be carefully extracted from the galbulus, plunged in boiling water for 10 seconds, then inclosed in a canvas or calico bag and immersed in cold water, and then sown, preferably in heather earth. It is important that plants of our flora should be tried almost exclusively in California and perhaps in Florida; for although *Juniperus cedrus* stands frost in its natural habitat at great altitudes, there is no doubt that our plants ought to be experimented with in climates like ours, where in the coast region we never have frost and the rains occur only in the winter months. I do not think you can lay too much stress on the fact that the seeds I have sent you should be tried only in southern California." (*Perez.*)

41464. ANNONA SQUAMOSA L. Annonaceæ.**Sugar-apple.**

Seeds from Saigon, Cochín China. Presented by Mr. P. Morange, Director of Agriculture. Received November 2, 1915.

"These seeds are known in Cochín China under the name of *Pomme-cannelle du Cap* (Cape cinnamon-apple.) The flesh of fruits of this variety when ripe presents a firm texture, with seeds comparatively rare, and does not split open, as is the case with the ordinary variety. This peculiarity allows the transportation of the fruit for long distances and should certainly make its exportation easy." (*Morange.*)

41465. PRUNUS JAPONICA Thunb. Amygdalaceæ.

From Changchun, Manchuria. Seeds presented by Dr. R. J. Gordon, Medical Mission Hospital. Received November 2, 1915.

"*Oulir* [yü li] stones." A bushy plant rarely over 5 feet high, with broadly ovate, acuminate, coarsely double-serrate leaves, rose-colored or blush flowers, in twos or threes, appearing with the leaves, and globular or short-oblong fruits, one-half inch in diameter, smooth and shining, wine red. (Adapted from Bailey, *Standard Cyclopedia of Horticulture*.)

41466 and 41467.

Seeds from Bangalore, India. Presented by Hodson & Co. Received November 3, 1915.

41466. ATALANTIA CEYLANICA (Arn.) Oliver. Rutaceæ.

See S. P. I. No. 41444 for previous description.

41467. PLEIOSPERMIUM ALATUM (Wight and Arnott) Swingle. Rutaceæ.
(*Limonia alata* Wight and Arnott.)

See S. P. I. No. 41445 for previous description.

41468 and 41469. BELOU MARMELOS (L.) Lyons. Rutaceæ. Bael.
(*Aegle marmelos* Correa.)

From Honolulu, Hawaii. Presented by Mr. J. E. Higgins, horticulturist, Agricultural Experiment Station. Received November 3, 1915.

Seeds from what is said to be the only tree of this species in the islands.

41470. QUISQUALIS INDICA L. Combretaceæ.

Seeds from Klayingchow, Swatow, China. Presented by Rev. George Campbell, through Mr. George Hanson, American consul, Swatow, China. Received November 23, 1915.

"*Kyun-tz* [chün tzü]. A vigorous climber with showy flowers, white at first but changing to pink. The seeds are used by the Chinese as a vermifuge and are sold at native drug shops." (*Campbell*.)

41471. CITRULLUS VULGARIS Schrad. Cucurbitaceæ. Watermelon.

Seed borne by a tree of S. P. I. 21249, sent to Mrs. Bow on February 20, 1911. American consul general. Received November 6, 1915.

"Seeds of a watermelon of the type which is most frequently found in the Constantinople market, the small spherical melon. These seeds were taken from a particularly fine fully ripe specimen, about 8 inches in diameter, with a good, sweet flavor, a very thin rind, and slightly fibrous flesh. These melons usually are on the market from early in July till the end of October. They vary in diameter from 4 to 15 inches." (*Ravndal*.)

41472. MACADAMIA TERNIFOLIA F. Mueller. Proteaceæ.**Queensland nut.**

From Homestead, Fla. Presented by Mrs. L. L. Bow. Received November 6, 1915.

Seed borne by a tree of S. P. I. 21249, sent to Mrs. Bow on February 20, 1911.

"You may be interested to know that these nuts make a delicious cake, and I have also used them in sandwiches and salads. My tree is near the laundry and gets a great deal of wash water, but it has had very little fertilizer besides the soapsuds." (*Bow*.)

41473. MEIBOMIA PURPUREA (Mill.) Vail. Fabaceæ.*(Desmodium incanum DC.)*

From Joinville, Brazil. Presented by Mr. Jean Knatz. Received November 8, 1915.

"I received this seed from a place on the near plateau, at an altitude of 2,500 feet, where the temperature goes down a few degrees below freezing point every winter." (*Knatz.*)

41474. DOCYNIA DELAVAYI (Franch.) Schneider. Malaceæ.**Wild pear.**

From Yunnanfu, China. Presented by Father Ducloux, Yunnanfu Catholic Mission, through the acting Commissioner of Customs, Mengtze, China. Received November 6, 1915.

"The tree is not often found in the regions around Yunnanfu." (*Ducloux.*)

These cuttings were sent in response to our request for a *Pyrus*, which Dr. Augustine Henry described in a letter some years ago, with fruits as large as an apple and edible. There are four ovules in each locule, yet it is rather an apple than a quince. It is not a good fruit as it stands, but it has not been cultivated by the Chinese, and its possibilities are unknown. It is called *to-i*.

41475. PRUNUS SERRULATA SACHALINENSIS (Schmidt) Makino.*(Prunus sargentii Rehder.) Amygdalaceæ. Sargent's cherry.*

From New Haven, Conn. Purchased from the Elm City Nursery Co. Received November 6, 1915.

One-year-old seedlings raised from seed obtained from the Arnold Arboretum. To be used in the cherry-stock investigations by Department officials.

41476. PÆONIA MLOKOSSEWITSCHII Lomakin. Ranunculaceæ. Peony.

Seeds from Tiflis, Caucasus, Russia. Presented by Mr. A. Roloff, director, Botanic Garden. Received November 10, 1915.

"This, the most handsome of the yellow-flowered pæonies, thrives under the treatment suitable for the other forms belonging to the herbaceous section of the genus, and appears as hardy and as satisfactory under cultivation as they have proved. The glaucous leaves with their red veins and margins contrast sufficiently with the more purely green leaves of *P. wittmanniana* to attract attention, and it is certain to become a favourite with gardeners. The fine sulphur-yellow flowers are more striking than the whitish yellow blooms of *P. wittmanniana*. *Pæonia mlokosewitschii* was discovered by Mlokosewitsch near Lagodekhi in the eastern part of the central Caucasus." (*Curtis's Botanical Magazine*, pl. 8173, 1908.)

41477. CORDEAUXIA EDULIS Hemsl. Cæsalpiniaceæ. Yeheb nut.

Seeds from Aden, Arabia. Presented by Mr. A. G. Watson, American vice consul, who obtained them from the governor of Italian Somaliland at Magadoxo. Received November 13, 1915.

An arid-land legume used as famine food by the Somalis.

See S. P. I. No. 29122 for previous introduction.

41478 to 41480.

Plants from Indian Head, Saskatchewan, Canada. Presented by Mr. Norman M. Ross, Forest Branch, Department of the Interior. Received November 15, 1915.

41478. BETULA PENDULA Roth. Betulaceæ.

Birch.

"Plants grown from seed picked from our plantation, the original seed of which was obtained from Russia. Two-year-old seedlings were planted 4 feet apart each way in 1908 and show a height of 12 to 16 feet and have borne seed for the past two or three years." (Ross.)

See S. P. I. Nos. 39489 and 39990 for previous introductions and description.

41479. CARAGANA PYGMAEA (L.) DC. Fabaceæ.

See S. P. I. No. 33756 for previous introduction.

For an illustration of this hedge plant, see Plate VII.

41480. CARAGANA ARBORESCENS Lam. Fabaceæ.

Siberian pea tree.

"Cuttings of the prostrate form; grown from seed picked in our ordinary hedges. We find that probably 1 per cent of the seedlings show these characteristics. This plant 5 years old shows a spread of 4 feet. We think this form can be used effectively for landscape planting." (Ross.)

41481. DUMORIA HECKELI A. Chevalier. Sapotaceæ.

Bako.

Seeds from Coomassie, Gold Coast Colony. Presented by Mr. A. E. Evans, traveling inspector, Agricultural Department. Received November 13, 1915.

"A gigantic sapotaceous tree attaining a height of 110 to 160 feet, with a cylindrical trunk $3\frac{1}{2}$ to $6\frac{1}{2}$ feet in diameter near the base [circumference approximately 10 to 20 feet], and rising 90 feet or more before bearing branches. Leaves oblong-lanceolate, papery, $2\frac{1}{2}$ to $4\frac{1}{2}$ inches long and 1 to $1\frac{1}{2}$ inches wide. Flowers solitary or in clusters of 2 to 3 in the axils of the leaves. Calyx campanulate, corolla rotate, greenish white, three-fourths inch in diameter, slightly fragrant. Fruit at maturity greenish yellow, spherio-ovoid, like a russet apple, with mellow, sickening pulp, bitter and nonedible. Geographic distribution, Ivory Coast, Gold Coast, Liberia, in the vast virgin forests. Flowers in May. The timber, reddish with beautiful markings, is one of the best African substitutes for mahogany." (Translation from the original description, *Comptes Rendus de l'Académie des Sciences, Paris*, vol. 145, p. 226, 1907.)

41482. RICINUS COMMUNIS L. Euphorbiaceæ.

Castor bean.

Seeds from Chungking, China. Presented by Mr. E. Widler. Received November 15, 1915.

"*Ping ma tsü*. A plant 6 to 9 feet in height, bearing white flowers; it takes about six months to grow. The seeds ripen throughout the season from early summer to frost. The seed is used principally for castor oil, which is prepared by pressing. The seeds are brown and black; they sell in the market for 1,000 cash for $2\frac{1}{2}$ catties." (Widler.)



A HARDY LOW-GROWING HEDGE PLANT (CARAGANA PYGMAEA (L.) DC.), S. P. I. No. 41479.

There is a growing demand for hedge plants and windbreak plants on the Plains of the Dakotas. The tall-growing Caraganas play a great rôle as windbreaks on the Canadian prairies, and this handsome low-growing species of the same genus is worthy of a place in the dooryards and along the drives throughout the bleak northwestern country. It will take rank with the barberry for, although it does not have red berries in winter, it is covered in summer with attractive flowers. (Photograph from Mr. N. M. Ross, Forest Nursery Station, Indian Head, Saskatchewan.)

41483. JUNIPERUS CEDRUS Webb. Pinaceæ. Teneriffe juniper.

Seeds from Teneriffe, Canary Islands. Presented by Dr. George V. Perez.
Received November 17, 1915.

See S. P. I. No. 41463 for previous introduction and description.

41484. JUBAEOPSIS CAFFRA Beccari. Phœnicaceæ.**Pondoland coco.**

Seeds from Johannesburg, Union of South Africa. Purchased from Mr. J. Burt Davy, botanist, Agricultural Supply Association. Received September 21 and October 7, 1915.

"I have just learned of the existence of a grove of wild coconut palms along the coast some 70 miles south of Port Shepstone. This appears to be a new species of coconut, adapted to warm temperate conditions; the nuts are said to be smaller than those of the typical *Cocos nucifera*. The fruits have the flavor of coconut and are much prized by the Tondos, who traveled scores of miles to collect and sell them. They are used as food, and, I am told, for oil." (Davy.)

"Until quite recently only two genera of palms were known from South Africa. A few years ago Mr. Charles Ross, then conservator of forests at Umtata, reported the occurrence of another kind in Pondoland. This has now been found to be the representative of a new genus named *Jubaeopsis*, from its nearest ally, *Jubaea*, a monotypic genus of South America (Chili). The fruit of *Jubaeopsis* differs from that of *Cocos* by the position of the germinating hoela, which in the latter genus are situated near the base of the nut, but in *Jubaeopsis* near its equator. The endosperm is hollow, as in the coconut, and also of a sweetish taste, but without milk. A tree up to 20 feet high, with leaves 12 to 15 feet long. The ♂ flowers are inserted on the upper parts of the branches of the spadix and possess 8 to 16 stamens, the ♀ flowers being on the lower parts. The fruits are about the size of walnuts, but nearly globular, the fibrous pericarp being yellow when ripe. The palm occurs, as far as known, only at two localities in Pondoland, viz., at the mouths of the Umsikaba and the Umtentu Rivers, in both cases only on the northern bank and in close proximity to the water. As this is, apart from the widely spread coconut palm, the only member of the tribe which occurs in Africa, all the others being American, its discovery throws some new light on the origin of the Cocolneæ and the relationship of our flora." (Marloth, *Flora of South Africa*, vol. 4, p. 48.)

41485 to 41488.

From Orotina, Costa Rica. Presented by Mr. Carlos Wercklé. Received November 16, 1915. Quoted notes by Mr. Wercklé.

41485. LICANIA PLATYPUS (Hemsl.) Fritsch. Rosaceæ. Sansapote.

"Seeds of the forest sansapote, which is the poorest and smallest fruit of all four or five species of *Licania*; still the little meat it has is quite good. A splendid, very large forest tree, the timber of which is considered nearly as valuable as *Cedrela*. I will try to graft the *Couepia* on it."

41486 and 41487. SOLANUM sp. Solanaceæ.

"Root cuttings of a very low-growing perennial herb, which makes a single, vertical root like a yuca (manioc), which enters into the soil to a great depth. I do not know whether it is edible or poisonous. The soft herbaceous plant spreads over the ground at a height of a few inches; the large, solitary, night-blooming flowers are a beautiful pure white and have a very fine fragrance, which, however, is only noticeable at a very short distance from the plant, though it is not mild."

41485 to 41488—Continued.

41488. ANNONA PURPUREA Moc. and Sesse. Annonaceæ. **Soncoya.**

"This fruit has only two defects—the seeds are too large and are 'cling.' It is recommended for crossing with *Annona squamosa* and *Annona cherimola*."

41489. HALEZIA CAROLINA MONTICOLA Lehder. Styracaceæ.

Mountain silverbell.

Seeds from Jamaica Plain, Mass. Presented by Prof. C. S. Sargent, Arnold Arboretum. Received November 13, 1915.

"The silver-bell tree of the Southern States, *Halesia tetraptera*, has long been cultivated in northern gardens. It is usually shrubby in habit with several stout, wide-spreading stems, and here at the North rarely grows more than 15 to 20 feet high. It is an inhabitant of the Southern States from West Virginia and southern Illinois to northern Florida and eastern Texas. It grows at low altitudes and does not appear to ascend to the slopes of the high Appalachian Mountains, although the *Halesia* of those mountain forests was long considered identical with the lowland tree. The *Halesia* of the high slopes, however, is a tree often 80 to 90 feet high, with a trunk 3 feet in diameter, sometimes free of branches for a distance of 60 feet from the ground. It is apparently only in recent years that this mountain tree has been introduced into cultivation by the Biltmore Nursery. From Biltmore it was sent to the parks of Rochester, N. Y., and from Rochester it came to the Arboretum with a description of its peculiar habit, large flowers, and fruit. The mountain tree, which has lately been distinguished here as var. *monticola*, grows as a tree from the time the seed germinates, and the seedlings show no variation of habit. Young trees are clean stemmed with short branches which form a narrow pyramidal head. The leaves are of rather different shape and less hairy than those of the lowland tree; the flowers are fully a third larger and the fruit is nearly twice as large. Trees less than 10 feet produce flowers and fruit in abundance. There is now every reason to believe that the mountain *Halesia* will prove one of the handsomest flowering trees of large size which it is possible to cultivate in this climate. Its tall trunk and narrow head suggest that it may prove a good street and roadside tree." (*Arnold Arboretum, Bulletin of Popular Information.*)

41490. COLOCASIA ESCULENTA (L.) Schott. Araceæ.

Tubers from Joinville, Brazil. Presented by Mr. Jean Knatz. Received October 25, 1915.

"*Cara* (*Kara*). *Cara* is much used to mix with flour after being baked, in order to make the bread used by the farmers, into which enter sweet potatoes, cassava, flour and 'taya,' especially now that wheat flour is so expensive. I think the larger sort of '*cara*' is the taro of the South Sea Islands." (*Knatz.*)

41491 and 41492.

Seeds from Chungking, China. Presented by Mr. E. Widler. Received November 18, 1915. Quoted notes by Mr. Widler.

41491. CUCURBITA PEPO L. Cucurbitaceæ. **Nan kua.**

"*Nan kua*. A creeping plant 10 to 15 feet long; grows best at a temperature of 70° to 110° F. It takes about three months to mature; bears yellow flowers and fruits in the autumn. The fruit is 5 feet in circumference and weighs about 40 catties. It is used only as a vegetable

41491 and 41492—Continued.

and is prepared by sweetening and boiling. It sells in the market for about 20 cash per catty."

41492. BENINCASA HISPIDA (Thunb.) Cogn. Cucurbitaceæ. Wax gourd.

"*Tung kua*. A plant 20 to 30 feet long. Grows best at a temperature of 70° to 110° F.; takes about six months to mature; bears yellow flowers and fruits in the autumn. The fruit is 3 feet long and 2 feet in circumference; is used only as a vegetable, boiled and sweetened, and sells in the market at 25 cash per catty."

41493. ANNONA CHERIMOLA Miller. Annonaceæ. Cherimoya.

Seeds from Brisbane, Australia. Presented by Mr. Leslie Gordon Corrie. Received November 22, 1915.

41494. RHAPHITHAMNUS CYANOCARPUS (Bert.) Miers. Verbenaceæ. Espina blanca.

Seeds from Bariloche, Argentina. Presented by Dr. Joseph Vereertbrugghen. Received November 22, 1915.

"This plant, *espina blanca* (white thorn), which I found in the Canyon Bariloche, is an evergreen belonging, I believe, to the Chilean vegetation. Animals eat it the year round and like it very much, horses as well as cattle." (Vereertbrugghen.)

41495. RANDIA sp. Rubiaceæ.

Seeds from Orotina, Costa Rica. Presented by Mr. Carlos Wercklé. Received November 24, 1915.

"From the Pacific coast. Is much more beautiful than *Randia aculeata*, but it is suitable for hot climates only." (Wercklé.)

41496. PERSEA AMERICANA Miller. Lauraceæ. Avocado.
(*Persea gratissima* Gaertn. f.)

Seeds from San Jose, Costa Rica. Presented by the Department of Agriculture. Received November 24, 1915.

"*Palta*. From tree A, bearing in October; large and medium good." (Wercklé.)

41497. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)

Seeds from Bordeaux, France. Presented by Mr. George A. Bucklin, jr., American consul. Received November 26, 1915.

"For these seeds we are indebted to a resident of this region, M. Denjean, of Bordeaux, France, who has carefully selected seeds of the finest specimens of fruit coming to his attention, all grown in this section of southern France. Unfortunately, the names of the varieties have not been preserved and the seeds identified, but it is hoped that the seeds which come from excellent miscellaneous stock will be of some service." (Bucklin.)

41498. AMYGDALUS PERSICA L. Amygdalaceæ. Peach.
(*Prunus persica* Stokes.)

Seeds from Milan, Italy. Presented by Mr. John H. Grout, American consul. Received November 26, 1915.

"Hardly any of the peaches to be found in the markets here are grown in this district, being brought from the outside. This is a mixed lot of seed obtained from a seed house here." (*Grout.*)

41499. DIPSACUS FULLONUM L. Dipsacaceæ. Teasel.

Seeds from Marseille, France. Presented by Mr. A. Gaulin, American consul general. Received November 23, 1915.

"Seeds of the best variety of teasel grown in the Avignon and Department of Vaucluse region. This sample was obtained from Messrs. G. and E. Duckers, of Gavaillon, Vaucluse." (*Gaulin.*)

41500. SPATHODEA CAMPANULATA Beauv. Bignoniaceæ.

Seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, director, Botanic Gardens. Received November 23, 1915.

See S. P. I. Nos. 31953 and 39415 for previous introductions.

41501. MIMUSOPS ELENGI L. Sapotaceæ. Munamal.

Seeds from Lawang, Java. Presented by Mr. M. Buysman, Jardin Botanique. Received November 27, 1915.

"A large evergreen tree, with glossy, oval, fleshy leaves. The wood is good for cabinetmaking, joinery, and turning. The fruit, which is shaped like an olive, is eaten, but its flavor is not very agreeable. The odorous flowers, which possess astringent and tonic properties, serve for the preparation of a perfume; the red, woody, fibrous bark is astringent and is used as a gargle for salivation. The fruit and seeds furnish an oil for burning. The root is astringent." (*Laessan, Les Plantes Utiles des Colonies Française.*)

See S. P. I. No. 30957 and 37726 for previous introduction.

41502. ARBUTUS UNEDO L. Ericaceæ. Strawberry tree.

Seeds from Sacramento, Cal. Presented by Mr. W. Vortriede, Capitol building and grounds. Received December 1, 1915.

"An evergreen tree, from 15 to 30 feet high, occasionally 40 feet in its native districts in Ireland, but nearly always a wide-topped shrub under cultivation; young shoots glandular hairy. Leaves smooth, 2 to 4 inches long, dark shining green. Flowers produced from October to December in drooping panicles 2 inches long and wide. Corolla white or pinkish, pitcher shaped, one-fourth inch long. Fruit globose, strawberrylike, three-fourths inch across, orange red, rough on the surface. It ripens during the autumn following the production of the flowers, at the same time as the succeeding crop of blossoms. Native of the Mediterranean region and southwestern Ireland, especially on the islands and shores of the Lakes of Killarney, where it attains its largest dimensions. (Adapted from W. J. Bean, *Trees and Shrubs Hardy in the British Isles*, vol. 1, p. 203.)

41503. ELAEOCARPUS sp. Elæocarpaceæ.

Seeds from Kamerunga, via Cairns, Australia. Presented by Mr. J. A. Hamilton. Received October 18, 1915.

"Native edible nut."

41504 to 41508.

Seeds from Matania El Saff, Egypt. Presented by Mr. Alfred Bircher, Middle Egypt Botanic Station. Received November 30, 1915.

41504. CARISSA GRANDIFLORA (E. Mey.) DC. Apocynaceæ. Natal plum.

"This handsome shrub, 15 to 18 feet in height, originally from South Africa, is cultivated in southern Florida and southern California for ornament and for its scarlet edible fruits the size of a plum. It is considered one of the best hedge plants in South Africa and is sometimes used for this purpose in the United States. The foliage is dense, glossy green in color; leaves opposite, thick, and leathery, 1 to 2 inches long, flowers star shaped, fragrant, about 2 inches across and borne in small terminal cymes. The plant blooms most abundantly in the early spring, but produces a few scattering flowers throughout the year; their waxy texture and fragrance are suggestive of the jasmine. The fruits, most of which ripen in summer, are ovoid or elliptic in form, commonly 1 to 2 inches long, with a thin skin inclosing the firm granular, reddish pulp, toward the center of which are several thin papery seeds, sometimes as many as twenty or more. The fruit is very attractive in appearance, but is not generally relished when eaten out of hand; its flavor suggests the raspberry or cranberry, and when stewed it yields a sauce which greatly resembles that made from the latter fruit. It is also used for jelly and preserves. It is not of commercial importance in the United States, but is frequently planted in gardens for ornament and fruit. When used as a hedge plant it withstands shearing admirably, but yields little fruit under these conditions. Its growth is compact and low, and it has the interesting habit of branching dichotomously. The plant is easily propagated by layering, and it is not difficult to bud, using the common method of shield budding. Late spring is the best time to do the work." (Adapted from W. Popenoe, in *Bailey, Standard Cyclopedia of Horticulture*, under *Natal plum*, vol. 4, p. 2114.)

See S. P. I. Nos. 11734, 28722, and 34166 for previous introductions.

41505. CARISSA GRANDIFLORA (E. Mey.) DC. Apocynaceæ. Natal plum.

See previous number (S. P. I. No. 41504) for description.

41506. CARISSA CARANDAS L. Apocynaceæ. Caraunda.

"*Maha-karamba* (Singhalese), *Perunkila* (Tamil). A small tree or large shrub, with sharp, rigid, forked thorns and oval leaves, native of the dry region of Ceylon; also of India and Malaya. It blossoms chiefly in February and March and ripens its fruits in August and September. The fruit when ripe much resembles a damson, both in size and color, but in the interior are a number of small seeds. In India it is made into a pickle just before it is ripe, and is also used in tarts and puddings, being considered to resemble gooseberries in flavour. For these purposes it is said to be superior to any other Indian fruit. When ripe it makes a very good jelly. The plant is commonly employed for barrier hedges, for which purpose it is well suited. Propagated from seed. Suited to dry districts at low elevations." (*MacMillan, Handbook of Tropical Gardening and Planting*, 2d ed., p. 149.)

See S. P. I. Nos. 23750 and 34364 for previous introductions.

41507. PHOENIX FARINIFERA Roxburgh. Phœnicaceæ. Palm.

Habitat, India and South China. A dwarf species, having a stem 2 feet high, completely enveloped by the leaf sheaths; fronds 6 feet long,

41504 to 41508—Continued.

unarmed, pinnate, reclinate, with long, awl-shaped, plicate leaflets; flowers diœcious; spathe polyvalved; spadix erect; fruit a drupe, oval, 1 cm. in length, fleshy, black, hard; stone single, oblong, horny. In Cochin China the plant goes under the name *Cay-cho la*. The trunk stripped of its leaves contains a certain quantity of starch which the poor use in case of need. This palm stands the climate of the south of France without protection. It is adapted to sandy and otherwise dry and barren land, but prefers the vicinity of the sea. (Adapted from *Von Mueller, Select Extra-Tropical Plants*, p. 373, and *De Lanessan, Les Plantes Utiles des Colonies Françaises*, p. 784.)

See S. P. I. No. 32821 for previous introduction.

41508. *MUSA* sp. Musacæ.**Banana.**

"Banana seeds which were produced without artificial pollination. I am not sure whether the pollen is from the same genus or from a *Strelitzia* growing near it. It is remarkable that only the variety *Orinoco* (from Florida) develops seeds, while several other varieties growing also in the vicinity are seedless." (*Bircher*.)

41509. *OSTERDAMIA TENUIFOLIA* (Trin.) Kuntze. Poacæ.*(Zoyisa tenuifolia Trin.)***Mascarene grass.**

Seeds from the island of Guam. Presented by Mr. J. B. Thompson, Guam Agricultural Experiment Station; obtained by him from the Bonine Islands. Received in 1912.

"This grass is used for lawn purposes in Japan and is said to succeed well about Yokohama. It was originally described from the Mascarene Islands. It has been tested in a preliminary way in California, at Biloxi, Miss., and at Miami, Fla. The grass makes a very beautiful dark-green turf, the leaves being short, never more than an inch or two long, much resembling the turf of red fescue. Stout rootstocks are produced in abundance, and these have a tendency to elevate the turf, a defect which can be remedied by proper rolling. The grass has considerable promise for fine turf and for golf purposes in the South." (*C. V. Piper*.)

41510 to 41516. *TRITICUM AESTIVUM* L. Poacæ.**Wheat.***(Triticum vulgare Vill.)*

Seed from Quetta Valley, Baluchistan. Presented by Mr. A. Howard, Imperial Economic Botanist, Pusa, Bengal, India. Received November 2, 1915. Quoted notes by Mr. Howard.

41510. "Common winter wheat. Spike bearded, 10 to 13 cm., tapering; glumes white, firm, glabrous; beaks 1 to 25 mm.; kernel red, large, 7 to 8 mm., hard."

41511. "Common winter wheat. Spike bearded, 10 to 12 cm., cylindrical; glumes white, glabrous; kernel amber, medium soft; beaks (a) 7 heads, 1 to 15 mm., (b) 3 heads, 1 to 2 mm."

41512. "Common winter wheat. Spike bearded, beards short, 3 to 4 cm.; glumes white, pubescent, kernel amber, medium hard; beaks 1 to 3 mm."

41513. "Common winter wheat. Spike bearded, cylindrical, 10 to 12 cm.; glumes white, pubescent; kernel amber, medium hard; beaks 1 to 20 mm."

41510 to 41516—Continued.

41514. "Common winter wheat. Spike bearded, tapering, 9 to 12 cm.; glumes brown, glabrous; kernel red, medium soft; beaks 1 to 15 mm."
41515. "Common winter wheat. Spike bearded, cylindrical, 10 to 12 cm.; glumes brown, glabrous; kernel amber (?), medium soft; beaks 1 to 25 mm."
41516. "Common winter wheat. Spike bearded, beards short, 3 to 4 cm.; spike cylindrical, 10 to 11 cm.; glumes brown, pubescent; kernel amber, medium soft; beaks 1 to 25 mm."

41517 to 41519. *PYRUS COMMUNIS* L. Malaceæ.

Pear.

From Salmon Arm, Canada. Presented by Mr. Thomas A. Sharpe. Received December 3, 1915. Quoted notes from L. Späth's catalogue, except as otherwise shown.

41517. *Eva Baltet*. "A very large, beautifully colored, melting, sweet pear, very juicy, and similar in the quality of the flesh to the *Holzfarbigen butterbirne* (*Fondante des bois*), but better flavored. Tree bearing early and heavily from mid-October to the end of November. This new French introduction is declared by a large number of growers to be an excellent pear, worthy of distribution."

Mr. T. A. Sharpe, ex-superintendent of the Agassiz (B. C.) Experiment Station, is very much interested in pear culture and is fruiting out a good many French varieties. He told me that the *Jules Guyot* was a much heavier bearer than the Bartlett, which it resembles very closely, and it has none of the objectionable muskiness of the Bartlett, and that the *Marguerite Marillat*, which is one of the few pears that fruit on the west coast of Scotland, does very well at Salmon Arm, B. C. The variety called *Eva Baltet*, an early fall pear, does particularly well here, and fruits abundantly; it was introduced in 1897. The fruits do not pull down the limbs, and it begins fruiting at the crotch." (*David Fairchild, trip report to Canada including British Columbia, fall of 1915.*)

41518. *Doktor Jules Guyot*. "A large to very large, excellent table and market pear, ripening in September. Tree bearing early and very heavily; not tender."

41519. *Marguerite Marillat*. "A large to very large, fine table pear, bearing early and heavily."

41520 to 41554.

Seeds from Bhutan, India. Collected by Mr. R. E. Cooper, and presented by Bees (Ltd.), Liverpool, England, at the request of Mr. A. K. Bulley. Received November 18, 1915. Quoted notes by Mr. Cooper.

41520. *PRIMULA* sp. Primulaceæ.

Primrose.

"(No. 4761.) Grows at an altitude of 11,000 feet in marshy peat in the open. White with star of yellow on corolla lobes."

41521. *PRIMULA* sp. Primulaceæ.

Primrose.

"(No. 4762.) Two feet tall, like *sikkimensis*, but brilliant golden yellow flowers. Grows in open glades by streams in *Abies* forest at an altitude of 11,000 feet. Clumps on peaty turf on bowlders in the streams themselves."

41520 to 41554—Continued. (Quoted notes by Mr. R. E. Cooper.)

41522. *LLOYDIA* sp. Liliaceæ.

"(No. 4763.) Common in an open marsh at an altitude of 11,000 feet. Small, yellow flowered."

41523. *PHYTEUMA* sp. Campanulaceæ.

"(No. 4766.) A plant 2 feet high. Grows on alpine peat turf at an altitude of 13,000 feet, a gray hairy mound with pendent narrow leaves emerging. Flowers never seen. Attacked by yaks, sheep, partridges, and spiders."

41524. *WULFENIA AMHERSTIANA* Benth. Scrophulariaceæ.

"(No. 4767.) A small herb found among loose pebbles and streams at an altitude of 14,000 feet, with rosette 6 inches in diameter. Flowers blue, small, in long spike."

41525. *MECONOPSIS SINUATA* Prain. Papaveraceæ.

"(No. 4768.) A prickly plant 1 to 2 feet high among small rhododendron bushes at an altitude of 13,000 feet. Flowers blue, 2 to 3 inches in diameter."

41526. *SWERTIA* sp. Gentianaceæ.

"(No. 4769.) A white-flowered mound 1 foot high on poor peaty soil overlying scree at altitudes of 13,000 to 14,000 feet."

41527. *POLYGONUM* sp. Polygonaceæ.

"(No. 4770.) A clumpy Polygonum among stones and peaty spots in gaps in rhododendron forests at an altitude of 13,000 feet. Club 1 foot thick or rosette larger. Flower spike large and pendent, rich red, 10 inches long at times. Also seen in rock ledges at its best."

41528. *PRIMULA* sp. Primulaceæ.

Primrose.

"(No. 4771.) One to two feet high, growing among rhododendron bushes at an altitude of 13,000 feet. Like *Primula obliqua*, dead white with no eye to speak of and with heads of eight flowers."

41529. *POTENTILLA* sp. Rosaceæ.

"(No. 4772.) Common on uplands, at times in peaty turf, at altitudes of 13,000 to 15,000 feet. A little heap of yellow flowers 9 inches in diameter."

41530. *IMPATIENS* sp. Impatiéntaceæ.

"(No. 4773.) Growing in 6-inch turfs by a stream edge among sandy compost at an altitude of 12,000 feet. Flowers yellow."

41531. *CALTHA* sp. Ranunculaceæ.

"(No. 4774.) A golden-yellow flowered, tufted plant in 2 inches of water in a swamp at an altitude of 13,000 feet."

41532. *SWERTIA* sp. Gentianaceæ.

"(No. 4775.) A small purple-flowered, procumbent-habited plant in peaty turf at an altitude of 13,000 feet."

41533. *CIRSIIUM* sp. Asteraceæ.

(*Cnicus* sp.)

"(No. 4776.) Grows on scree among Juniperus at an altitude of 13,000 feet. Large, white haired, prickly. White head of one to five inflorescences, 2 inches in diameter.

41520 to 41554—Continued. (Quoted notes by Mr. R. E. Cooper.)**41534. CREMANTHODIUM** sp. Asteraceæ.

"(No. 4777.) With yellow nodding heads, on dry exposed grass-covered slopes at altitudes of 13,000 to 14,000 feet."

41535 to 41540. PRIMULA spp. Primulaceæ.**Primrose.**

41535. "(No. 4779.) A small plant occurring in swampy peat at an altitude of 13,000 feet. Large flowers of delicate heliotrope, sweet scented; two to four in a head on a slender stem."

41536. "(No. 4780.) Like *sikkimensis*, but a smaller plant. Six inches high in swampy peat, growing with No. 41535. Flowers yellow, hanging three to five in a head; very delicate."

41537. "(No. 4781.) Among peaty soil and rocks of scree at altitudes of 13,000 to 14,000 feet. Flowers yellow."

41538. "(No. 4783.) *AP. nivalis*?) Grows among moist peaty turf among boulders by streams at an altitude of 13,000 feet. Showy heads of purple flowers, with eye. Flowers appear before leaves."

41539. "(No. 4784.) Grows at edge of marsh in moist peat; altitude 13,000 feet. Reticulate, petiolate leaves and leafy bracts at base of loose inflorescences of yellow flowers of *sikkimensis* type."

41540. "(No. 4785.) Grows in marsh at an altitude of 13,000 feet; flowers small, white, in loose head; leaves small and coriaceous."

41541. MECONOPSIS HORRIDULA Hook. f. and Thoms. Papaveraceæ.

"(No. 4786.) Plant tufted on peaty turf at an altitude of 15,000 feet. Large sky-blue flowers."

41542 to 41544. PRIMULA spp. Primulaceæ.**Primrose.**

41542. "(No. 4787.) Grows in sandy soil on sheltered rock ledges at an altitude of 14,000 feet. Allied to *Primula tibetica*, but heads much looser and flowers larger."

41543. "(No. 4788.) A small primrose with large flowers, pale heliotrope, two to four on a loose spike. Grows in shaded crevices at an altitude of 13,000 feet."

41544. "(No. 4744.) Grows in moist peat at an altitude of 10,000 feet. Flowers yellow."

41545. POLYGALA sp. Polygalaceæ.

"(No. 3985.) The rosette is a nest of leaves 4 inches in diameter in moist peaty soil. There is a head of small white flowers one-half inch in diameter on a stalk 3 inches high; growing at an altitude of 11,000 feet."

41546. EUPHORBIA sp. Euphorbiaceæ.

"(No. 4351.) A tuberous herb growing on peaty slopes and meadows at an altitude of 9,000 feet. Inflorescences a showy gold."

41547. PRIMULA sp. Primulaceæ.**Primrose.**

"(No. 4392.) (Perhaps *Primula elongata*.) In fruit among rhododendron bushes at an altitude of 12,500 feet; flowers said to be white."

41548. PRIMULA PETIOLARIS Wallich. Primulaceæ.**Primrose.**

"(No. 4397.) A variety growing at an altitude of 12,000 feet and preferring moist soil, with dead leaves in compost in the shade of *Betula*, rhododendron bushes, etc. Rosette 1 foot in diameter, flower spike 1 foot high; seen only in fruit."

41520 to 41554—Continued. (Quoted notes by Mr. R. E. Cooper.)**41549. POLYGONUM sp. Polygonaceæ.**

"(No. 4407.) A clump of Polygonum among stones and peaty spots in gaps in a rhododendron forest at an altitude of 13,000 feet. Clump 1 foot thick or rosette larger. Flower spike large and pendent, rich red, 10 inches long at times. Also seen in rock ledges at its best."

41550. AQUILEGIA sp. Ranunculaceæ.

"(No. 4410.) An herb 1 foot high in fruit among Cyananthus and moist undergrowth of Betula forest at an altitude of 10,000 feet. Flowers never seen."

41551. CORYDALIS sp. Papaveraceæ.

"(No. 4511.) An herb 1 foot high on moist gravel by a stream at an altitude of 11,000 feet. Very showy sprays of yellow, brown-tipped flowers, usually under light shade of Acers, etc."

41552. PRIMULA PETIOLARIS Wallich. Primulaceæ.**Primrose:**

"(No. 4512.) Differing from No. 41548 in leaves not being hastate. Found in fruit at an altitude of 12,000 feet in moist black soil under Abies forest. Plant similar in size to No. 4397 [S. P. I. No. 41548.]"

41553. RUBUS sp. Rosaceæ.**Bramble.**

"(No. 4513.) A bush 2 feet high, showy in autumn with silver foliage and orange-yellow fruits. Common in bamboo forests at an altitude of 11,000 feet."

41554. RUBUS sp. Rosaceæ.**Bramble.**

"(No. 4514.) A bush 4 feet high on edge of Abies forest at an altitude of 12,000 feet. Leaves dark green with reddish brown calyx and fruits."

41555. HEDYSARUM BOREALE Nutt. Fabaceæ.

Seeds from Saskatoon, Canada. Collected by Mr. David Fairchild, of the Bureau of Plant Industry. Received October 25, 1915.

"This hardy, short-seasoned, early-maturing Hedysarum was collected by Prof. T. N. Willing and myself in sight of the president's residence on the grounds of the University of Saskatchewan. It was growing on rather dry hillsides and produced a plant about 2 feet high. It is apparently a heavy seeder and, according to Prof. Willing, the cattle are very fond of it. So far as he knew, it had never been cultivated, and I sent it with the idea that it might be crossed with *Hedysarum coronarium* or with species of *Hedysarum* sent in by Mr. Meyer from Siberia. I can not help thinking that there may be something in the cultivation of this plant for forage purposes." (Fairchild.)

41556 to 41565.

Seeds from Bhutan, India. Collected by Mr. R. E. Cooper and presented by Bees (Ltd.), Liverpool, England, at the request of Mr. A. K. Bulley. Received November 18, 1915. Quoted notes by Mr. Cooper.

41556. GAULTHERIA sp. Ericaceæ.

"(No. 4525.) A low-creeping plant on rock surfaces and peaty alpine turf at an altitude of 12,000 feet. The showy blue berries are profuse. This is a much larger plant than the *Gaultheria trichophylla* and exists on exposed rock faces with only a mere suspicion of soil in occasional crevices."

41556 to 41565—Continued. (Quoted notes by Mr. R. E. Cooper.)**41557. CORYDALIS** sp. Papaveraceæ.

"(No. 4528.) A slender herb in fruit under *Abies* forest at an altitude of 12,000 feet."

41558. LEYCESTERIA FORMOSA Wallich. Caprifoliaceæ.

"(No. 4535.) Caprifoliaceæ (?). A bush 6 feet high under light shade in *Acer* and *Picea* forest at an altitude of 10,000 feet. Flowers pink backed by red bracts, in dense sprays at end of fresh wood shoots."

41559. CLINTONIA sp. Convallariaceæ.

"(No. 4545.) A liliaceous plant found in loose peaty soil under rhododendron forest at an altitude of 10,500 feet. Two basal leaves and a head of delicate blue flowers pendent on a slender stem 6 inches long."

41560. LONICERA sp. Caprifoliaceæ.**Honeysuckle.**

"(No. 4553.) A slender bush 6 inches high by a stream under rhododendron and *Abies* forest at an altitude of 11,000 feet. Has pink waxy flowers in pairs and very showy reddish fruits."

41561. SALVIA sp. Menthaceæ.

"(No. 4671.) A very fine herb 1 to 2 feet high, color vandyke to prune. In turf of exposed hilltop at an altitude of 9,000 feet."

41562. CORIARIA TERMINALIS Hemsl. Coriariaceæ.

"(No. 4736.) A procumbent shrub on sandy soil by streams and among bracken at an altitude of 10,500 feet; terminal sprays of red fruits 8 inches long. Quite hardy, I should say, as it occurs some 5,000 feet above the half hardy *Coriaria nepalensis*. Not so showy a plant as the latter, but trailing well over rock and gravel."

41563. LONICERA sp. Caprifoliaceæ.**Honeysuckle.**

"(No. 4737.) A bush 5 feet high by the edge of a stream among *Salix* and roses, with showy red fruits."

41564. POTENTILLA sp. Rosaceæ.

"(No. 4749.) On an exposed hilltop at an altitude of 10,000 feet in clayey soil. A silver rosette 4 inches across with sprays of yellow flowers."

41565. HYPERICUM LEPTOCARPUM Hook. f. and Thoms. Papaveraceæ.

"(No. 4751.) A procumbent herb on gravelly sandy soil. Six inches across rosette, flowers smallish but profuse, of a delicate heliotrope to rose color; foliage steel gray."

41566. PRUNUS SUBHIRTILLA AUTUMNALIS Makino. Amygdalaceæ.**Cherry.**

Plant from Colchester, England. Procured from R. Wallace & Co. Received December 4, 1915.

"Under the erroneous name of *Prunus miqueliana* this cherry has been cultivated in this country for some three or four years and has created a good deal of interest because of its flowering from November onward. Owing, probably, to the excessive mildness of the late autumn of 1913, it made a very charming display at that time. It is a deciduous small tree with nearly ovate leaves, 1½ to 3½ inches long, hairy on both surfaces. Flowers pale pink, 1 inch wide." (*Kew Bulletin*.)

41567. WASABIA PUNGENS Matsumura. Brassicaceæ. **Wasabi.**
(*Eutrema wasabi* Maxim.)

Roots from New York, N. Y. Presented by Mr. H. Terao. Received December 6, 1915.

"Before cooking, the graded wasabi is usually beaten so that the root cells may be mostly broken up, as you have perhaps learned in Japan. It is said that there is no *wasabi* for sale in New York City yet. Two Japanese restaurants here get 50 roots a year from San Francisco, where the *wasabi* comes from Japan." (Terao.)

41568. DIOSPYROS EBENASTER Retz. Diospyraceæ. **Black sapote.**

Seeds from Honolulu, Hawaii. Presented by Mr. Gerrit P. Wilder. Received December 4, 1916.

A tall tree with fragrant white flowers and very sweet fruits, the size of an orange, green outside and almost black within. Native of Mexico. See S. P. I. Nos. 39719 and 40338 for previous introductions and full description.

41569. FRAXINUS EXCELSIOR L. Oleaceæ. **Ash.**

From Dublin, Ireland. Presented by Dr. A. Henry, Royal College of Science. Received December 1, 1915.

Var. *monophylla*. One-leaved ash. In this remarkable variety of the common European ash the terminal leaflet only, or occasionally one or two more, is developed. In other respects it is the same as the common ash. Its one leaf is oval or ovate, long stalked, toothed, and variable in size, usually 3 to 6 inches long, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches wide, but often proportionately broader or shorter. I have measured it as much as 8 inches long and 5 inches wide. This variety has arisen independently in many places, both cultivated and wild, and varied considerably. It is also known as *integrifolia*, *heterophylla*, and *simplicifolia*. The species itself is one of the most valuable of all our timber trees, yielding a whitish wood of great toughness and durability. Elwes considers it at the present time the most economically valuable of British timber trees. For some purposes, especially in coach building and implement making, it has no rival, either native or foreign. An isolated ash of goodly size makes a tree of great beauty and dignity, forming a shapely oval or rounded head of branches. It likes a deep moist, loamy soil, and thrives well on calcareous formations. In some parts of the north of England, on the east side of the Plain of York, for instance, it is a common hedgerow tree, almost as common as the elm is in the south. In such positions, especially where the adjoining fields are arable, it is not an unmixed advantage, being one of the grossest of feeders. (Adapted from W. J. Bean, *Trees and Shrubs Hardy in the British Isles*, vol. 1, p. 567.)

41570. INDIGOFERA TINCTORIA L. Fabaceæ. **Indigo.**

From Paris, France. Presented by Vilmorin-Andrieux & Co. Received December 18, 1915.

See Sir George Watt's Commercial Products of India for a full description of the various indigo-yielding species of *Indigofera* and the cultivation and manufacture of indigo.

41571. CROTALARIA CUNNINGHAMII R. Brown. Fabaceæ.

From Wellington Point, near Brisbane, Queensland, Australia. Presented by Mr. James Pink. Received December 7, 1915.

"I am of the opinion that under cultivation it will prove an acquisition for ornamental planting, and in dry situations it may become a rival to the herbaceous Calceolaria. The plant grows about 2 feet high and will bear topping to any extent, every lateral throwing up a spike of flowers of bright orange yellow." (*Pink.*)

Though unattractive as to the color of the flower, this is a very curious and striking greenhouse plant, the soft velvety pubescence that clothes all the surfaces with a uniform glaucous hue at once arresting the attention. It is a native of the dry, almost desert regions of northwestern and central Australia, growing on sandy ridges, from Sharks Bay to the Gulf of Carpentaria, and penetrating southward through central Australia toward Spencers Gulf. A shrub 2 to 3 feet high, everywhere covered with a soft gray-green tomentum. (Adapted from *Curtis's Botanical Magazine*, p. 5770.)

41572. MALUS SARGENTII Rehder. Malacææ.

From Tokyo, Japan. Presented by Dr. T. Watase, Tokyo Plant, Seed & Implement Co. Received December 4, 1915.

A shrub of bushy habit 3 to 5 feet high; leaves ovate to oval, 2 to 3 inches long, 1 to 2 inches wide; woolly when quite young, becoming nearly smooth before falling; flowers pure white, 1 inch across, produced in clusters of five or six; fruit orange shaped, one-half inch wide, bright red, the apex marked by the scar of the fallen calyx. I only know this species by a small specimen sent to Kew by Prof. Sargent in 1908, but it appears to be a pretty plant, and distinct among crabs by its purely bushy habit. It was originally discovered by Sargent in 1892 near a brackish marsh, Muroran, Japan, and was named in his honor by Mr. Rehder in 1903. The author observes that it is most nearly related to *P. toringo*, but differs in its larger, pure-white flowers with broad overlapping petals and in its larger fruits. From another ally, *P. zumi*, it is distinguished by its broader, often-lobed leaves, the shape of the broader based petals, the glabrous calyx tube, and the habit. Adapted from W. J. Bean, *Trees and Shrubs Hardy in the British Isles*, vol. 2, p. 293.)

41573. CHAYOTA EDULIS Jacq. Cucurbitacææ.**Chayote.**

(*Sechium edule* Swartz.)

From Camaguey, Cuba. Presented by Mr. Robert L. Luáces, director, Granja Escuela. Received December 20, 1915.

"Chayotes of the green variety. Of these four, one has been sprouted off the vine and the others on the vine. We, here in Cuba, either sprout on the vine or over water; that is, taking the chayote from the vine and putting it in the mouth of a wide-mouthed bottle until it sends out the sprout. It is also common to cut off the lower end of the fruit before planting and allow the wound to heal over either simply in the air or by covering the wound with ashes." (*Luáces.*)

41574. BARYXYLUM INERME (Roxb.) Pierre. Cæsalpiniaceæ.*(Peltophorum ferrugineum Benth.)*

From Littleriver, Fla. Presented by Mr. Charles T. Simpson. Received December 3, 1915.

"A large, quick-growing, symmetrical tree, with a spreading top and fine graceful feathery foliage, indigenous to Ceylon and Malaya. The young leaves and shoots are covered with a brown velvet tomentum, from which the tree takes its specific name. The tree flowers twice a year at irregular seasons, some specimens being in blossom while others by its side are in ripe fruit. The flowers are rusty yellow, sweet scented, and borne in large erect panicles. Trimen, in his Flora of Ceylon, stated: 'It is a magnificent sight when in full bloom.' It is specially suited to dry districts, but also thrives to perfection in the moist region up to 1,800 feet." (*MacMillan, Handbook of Tropical Gardening and Planting, 2d ed., p. 299.*)

See S. P. I. Nos. 34330 and 38655 for previous introductions.

41575. ROYSTONEA FLORIDANA Cook. Phœnicaceæ.**Florida royal palm.**

The royal palm of Florida is commonly referred to *Oreodoxa regia*, though with very doubtful propriety. The branches of the inflorescence are much longer and more lax than those of the species of Cuba and Porto Rico, from which they also differ in the frequent development of tertiary branches, in this respect resembling *Roystonea oleracea*. The fruits do not resemble those of *Roystonea oleracea*, but are closely similar to those of the other species, though somewhat smaller and more nearly spherical. The Florida trees are from 28 to 35 meters high and occasionally as high as 45 meters, while the royal palms of Cuba and Porto Rico seldom exceed 18 meters. Mr. Charles T. Simpson, of the United States National Museum, states that the palms of southwestern Florida lack the conspicuous bulge so characteristic in the trunks of the Porto Rican trees and that they grow almost in reach of tidewater, while the natural habitat of the Porto Rican species is evidently the limestone hills. In view of these differences it seems preferable to treat the Florida royal palm as a distinct species, for which the name *Roystonea floridana* is proposed. (Adapted from O. F. Cook, *Bulletin of the Torrey Botanical Club, p. 554.*)

See S. P. I. No. 9731 and 17060 for previous introductions.

41576. TERMINALIA CATAPPA L. Combretaceæ. Malabar almond.

From Littleriver, Fla. Presented by Mr. Charles T. Simpson. Received December 3, 1915.

A handsome deciduous tree with branches in horizontal whorls, large alternate leaves, clustered toward the ends of the branches and usually turning scarlet before falling, and an edible almondlike fruit.

A very common tree in Guam, often growing near the shore, but also found inland. The kernels of the fruit are of a fine almondlike consistency and flavor. The crows (*Corvus kubaryi*) are very fond of them, and the natives eat them as delicacies, either fresh or candied. The bark and leaves are astringent and contain tannin. In India they are mixed with iron salts to form a black pigment, with which the natives in certain localities color their teeth and make ink.

This species is an excellent shade tree. It is of wide tropical distribution and is often planted for ornament and for the sake of the nuts. It has been introduced into Hawaii and the natives have applied to it the Polynesian name for *Calophyllum inophyllum* (*kamanu* or *kamani*), owing to the appearance of its foliage, which from a distance looks somewhat like that of the latter species. It is easily propagated from the seed. The wood is hard and of a reddish color, the sapwood lighter colored than the heartwood. In Guam it is used for troughs, carts, and posts, and if *daog* wood (*Calophyllum inophyllum*) can not be obtained, it is used for making cart wheels, though it is inferior to that species in toughness and durability. The Fijians and Samoans make drums of the hollowed trunks." (*Safford, Useful Plants of Guam, p. 385.*)

See S. P. I. Nos. 33192 and 33655 for previous introductions.

41577. PRUNUS SERRULATA SPONTANEA (Maxim.) Wilson. Amygdalaceæ. Cherry.

From Kyoto, Japan. Presented by Miss E. R. Scidmore, Yokohama, Japan.
Received December 11, 1915.

"Cuttings of *Yama zakura* (mountain cherry), the *Ghou* cherry tree in Maruyama Park (Sea-Mountain Park), Kyoto. It is a drooping variety, and these cuttings must be grafted on a drooping variety to get good results." (*Scidmore.*)

41578 to 41580. PERSEA AMERICANA Miller. Lauraceæ. Avocado.
(*Persea gratissima* Gaertn. f.)

From Guatemala City, Guatemala. Presented by the American vice consul.
Received December 8, 1915. Quoted notes by the vice consul.

41578. "Seeds of soft-skin avocados. All selected fruit which averaged in weight 1 pound 2 ounces."

41579. "Round; skin hard."

41580. "Soft-skin Guatemala avocados, weighing up to 1 pound each."

41581 to 41618.

From Bhutan, India. Collected by Mr. R. E. Cooper. Presented by Bees (Ltd.), Liverpool, England, at the request of Mr. A. K. Bulley. Received December 8, 1915. Quoted notes by Mr. Cooper.

41581. PRIMULA ELONGATA Watt. Primulaceæ. Primrose.

"(No. 4087.) In sandy peaty soil at an altitude of 13,500 feet. Flowers white on stem 1 foot long, rosette of glabrous leaves, 8 inches in diameter."

41582. MECONOPSIS HORRIDULA Hook. f. and Thoms. Papaveraceæ.

"(No. 4810.) A many-stemmed plant, 6 inches high at an altitude of 14,000 feet on peaty turf over scree. Flowers blue, large; plant prickly.

41583. SWERTIA sp. Gentianaceæ.

"(No. 4812.) Tufted gentianaceous plant, growing in peaty turf among dwarf rhododendrons at an altitude of 15,000 feet. Spike of blue flowers 4 inches long."

41581 to 41618—Continued. (Quoted notes by Mr. R. E. Cooper.)**41584. SAUSSUREA** sp. Asteraceæ.

"(No. 4818.) With papery translucent bracts; grows among fragments of granite rock and peaty soil on scree at an altitude of 14,000 feet. Plant 10 inches high; head 4 inches in diameter."

41585. LILIUM sp. Liliaceæ.

Lily.

"(No. 4819.) Grows in turf on rock ledges at an altitude of 13,000 feet. Flowers reddish green, hanging bell-like on a 6-inch stem."

41586. CARDAMINE sp. Brassicaceæ.

"(No. 4821.) Small slender rambling crucifer with showy blue flowers growing over grass or turf by a stream at an altitude of 12,000 feet."

41587. PRIMULA sp. Primulaceæ.

Primrose.

"(No. 4822.) *A la tibetica* (blue sp.). Found only in fruit that was hardly ripe on exposed peak at an altitude of 16,000 feet, growing in a dryish but sunny position at the base of large overhanging rocks."

41588. ARENARIA sp. Silenaceæ.

"(No. 4824.) Tufted *Arenaria* sp. Grows on granite boulders at an altitude of 14,000 feet. Flowers white."

41589. SALVIA sp. Menthaceæ.

"(No. 4825.) Pink-flowered, silvery, hairy plant 6 inches high on gravel and scarce peaty compost, mostly gravel, growing on scree at an altitude of 16,000 feet."

41590. MECONOPSIS NAPAULENSIS DC. Papaveraceæ.

"(No. 4827.) Plants growing on bare exposed hillside of patchy turf and boulders at an altitude of 14,000 feet."

41591. SWERTIA HOOKERI C. B. Clarke. Gentianaceæ.

"(No. 4828.) A tall column (3 feet) of reddish flowers growing in peaty turf among dwarf junipers at an altitude of 13,000 feet."

41592. MECONOPSIS LYRATA (Cumm. and Prain) Fedde. Papaveraceæ.

"(No. 4840.) A yellow-flowered herb 3 feet high at base of rock cliffs in soil similar to that of Abies forest at an altitude of 11,000 feet."

41593. PRIMULA sp. Primulaceæ.

Primrose.

"(No. 4855.) Allied to *Primula tibetica*, but only found in fruit not fully ripe on granite débris at an altitude of 16,000 feet."

41594. MORINA sp. Dipsacaceæ.

"(No. 4914.) Tall plant 1 to 2 feet high, arising from rosette of regular falling spiny leaves; whorls of reddish (?) flowers on upright prickly bracted stem; growing in sheltered recess of bare exposed hill in little plat of turf over gravel at an altitude of 10,500 feet."

41595. CORIARIA TERMINALIS Hemsl. Coriariaceæ.

"(No. 4757.)" See S. P. I. No. 41562 for previous introduction and description.

41581 to 41618—Continued. (Quoted notes by Mr. R. E. Cooper.)

41596. *SAMBUCUS ADNATA* Wallich. Caprifoliaceæ.

"(No. 4794.) Caprifoliaceous herb on loamy bank in *Picea* forest at an altitude of 9,000 feet. Head 10 inches in diameter, of scented white flowers turning to red fruits."

41597. *SAUSSUREA GOSSIPIPHORA* D. Don. Asteraceæ.

"(No. 4815.) A white woolly mass 10 inches high and 6 inches in diameter, on granite and peaty débris at an altitude of 14,000 feet."

41598. *RUBUS* sp. Rosaceæ.

Bramble.

"(No. 4685.) "

41599. *ALLIUM* sp. Liliaceæ.

"(No. 4816.) Three feet tall in moist turf and gravel by the edge of a stream, usually with *Primula sikkimensis*, at an altitude of 12,000 feet. Head of white flowers."

41600. *CARAGANA* sp. Fabaceæ.

"(No. 4882.) Tufted legume with wiry pinnate leaves, on exposed turf of hillside at an altitude of 12,000 to 13,000 feet."

41601. *CARAGANA BREVISPIA* Royle. Fabaceæ.

"(No. 4883.) Spiny shrub 6 feet high. Grows in shade by stream in gravelly soil under *Abies* forest and oaks at an altitude of 10,000 feet."

41602. *POTENTILLA CORIANDRIFOLIA* D. Don. Rosaceæ.

"(No. 4886.) A tufted herb 4 inches in diameter, growing in rock crevices and open thin turf over gravel at an altitude of 13,000 feet. Flowers white, center dark red."

41603. *SWERTIA MULTICAULIS* D. Don. Gentianaceæ.

"(No. 4890.) A blue-flowered, tufted plant occurring in poor, black, sodden soil among scree débris (granite) at an altitude of 15,000 feet."

41604. *POTENTILLA* sp. Rosaceæ.

"(No. 4891.) Drooping lax habit, from rock ledges on granite bowlders and cliffs at an altitude of 15,000 feet."

41605. *SAXIFRAGA* sp. Saxifragaceæ.

Saxifrage.

"(No. 4893.) On peaty meadow at an altitude of 13,000 feet. Flowers yellow."

41606. *GENTIANA* sp. Gentianaceæ.

Gentian.

"(No. 4895.) Tufted plant on granite débris and a little peaty soil at an altitude of 15,000 feet. Flowers blue."

41607. *GENTIANA* sp. Gentianaceæ.

Gentian.

"(No. 4896.) Rosette plant growing among No. 4895 [S. P. I. No. 41606]. Flowers blue."

41608. *SAUSSUREA GOSSIPIPHORA* D. Don. Asteraceæ.

"(No. 4897.) A white woolly clump 8 inches in diameter, growing on rock ledges among stone chips and poor soil at an altitude of 15,000 feet."

41581 to 41618—Continued. (Quoted notes by Mr. R. E. Cooper.)**41609. MECONOPSIS** sp. Papaveraceæ.

"(No. 4898.) A bushy, spiny plant among boulders and gravel on an island of a stream at an altitude of 13,000 feet. Flowers, 24 to a plant, not seen. Either *Meconopsis horridula* or *Meconopsis sinuata*, but typical of neither."

41610. HYDRANGEA sp. Hydrangeaceæ.

"(No. 4900.) Bush 3 feet high in peaty and sandy soil in the shelter of a hill by a stream at an altitude of 12,000 feet. Best ever."

41611. GENTIANA sp. Gentianaceæ.**Gentian.**

"(No. 4901.) An herb 4 feet high growing among rhodendron scrub at an altitude of 12,500 feet. Yellow, well-shaped flowers."

41612. SAUSSUREA sp. Asteraceæ.

"(No. 4904.) A tufted plant in peaty turf at an altitude of 13,000 feet. Flowers purple, rosette 8 inches in diameter, leaves much cut and frilled."

41613. SAXIFRAGA sp. Saxifragaceæ.**Saxifrage.**

"(No. 4905.) Mat habited on peaty turf at an altitude of 13,000 feet. Flowers pink and white on 2-inch upright stems."

41614. SAUSSUREA sp. Asteraceæ.

"(No. 4906.) A woolly gray mound 6 inches in diameter on scree debris at an altitude of 14,000 feet. Flowers yellow."

41615. CYANANTHUS LOBATUS Wallich. Campanulaceæ.

"(No. 4908.) Procumbent herb on turf at an altitude of 13,000 feet, with erect, large blue flowers."

41616. SESELI sp. Apiaceæ.

"(No. 4909.) A graceful tufted umbellifer, 6 to 10 inches high, on sandy turf at an altitude of 13,000 feet. Head of pink and white flowers."

41617. CYANANTHUS sp. Campanulaceæ.

"(No. 4910.) (Perhaps new.) A small tufted plant, rosette only 4 inches in diameter in fruit. Grows in gravelly and peaty turf by a lake at an altitude of 13,000 feet."

41618. ANISOMELES OVATA R. Brown. Menthaceæ.

"(No. 4913.) An herb 4 inches high with white, solitary large flowers. On gravelly exposed sites at an altitude of 10,500 feet."

41619. CANAVALI OBTUSIFOLIUM (Lam.) DC. Fabaceæ.

From Burringbar, New South Wales, Australia. Presented by Mr. B. Harrison. Received December 15, 1915.

"A native pink-flowered bean growing on the beach or seacoast here to a length of 20 or 30 feet. It is regarded as a poisonous plant by some writers, although it is said to be a good poultry food." (*Harrison.*)

41620. CANAVALI GLADIATUM (Jacq.) DC. Fabaceæ. Sword bean.

From Chungking, China. Presented by Mr. E. Widler. Received December 21, 1915.

"*Ta tao tou*, great bean. A plant 10 to 15 feet long, bearing red flowers; it takes about six months to grow, and fruits in the autumn. It does best in a

climate of 70° to 100° F. It bears fruit 1 foot 8 inches long, 5 inches in circumference. The seeds are light red and are used principally as a vegetable, being prepared by boiling. They sell in the market for 20 cash each string." (Widler.)

41621. CHAYOTA EDULIS Jacq. Cucurbitaceæ. Chayote.
(*Sechium edule* Swartz.)

From Orotina, Costa Rica. Presented by Mr. Carlos Wercklé. Received December 23, 1915.

Light green.

41622. GARCINIA sp.

From Brazil. Collected by Mr. H. M. Curran. Received December 20, 1915.

"Species cultivated in the Rio de Janeiro Botanical Gardens. Trees 30 to 40 feet high, 16 to 18 inches in diameter, with a heavy crop of large fruit, approximately 2 inches in diameter, with yellow acid flesh. Probably a common variety from India." (Curran.)

41623 and 41624.

From Seharunpur, India. Presented by Mr. A. C. Hartless, superintendent, Government Botanic Gardens. Received December 16, 1915.

41623. EUCALYPTUS KIRTONIANA F. Mueller. Myrtaceæ. Eucalyptus.

"Seeds collected in this garden from trees known here for many years as *Eucalyptus saligna* and recently identified by Maiden as *Eucalyptus kirtoniana*. The seeds were probably originally from Australia." (Hartless.)

41624. TAMARIX DIOICA Roxburgh. Tamaricaceæ. Tamarisk.

A small tree with drooping branches and clustered twigs, smooth green leaves, and panicle spikes of small pink flowers with purple anthers. Native of India and Burma. (Adapted from Hooker, *Flora of British India*, vol. 1, p. 249.)

41625 and 41626. CHAYOTA EDULIS Jacq. Cucurbitaceæ. Chayote.
(*Sechium edule* Swartz.)

From Camaguey, Cuba. Presented by Mr. Robert L. Luaces, director, Granja Escuela. Received December 28, 1915.

41625. White.

41626. Long green.

41627 and 41628. CHAYOTA EDULIS Jacq. Cucurbitaceæ. Chayote.
(*Sechium edule* Swartz.)

From San Jose, Costa Rica. Presented by Mr. Carlos Wercklé, Department of Agriculture. Received December 28, 1915.

41627. Round white, spiny.

41628. Round green, spiny.

41629. PERSEA AMERICANA Miller. Lauraceæ. Avocado.
(*Persea gratissima* Gaertn. f.)

From Guatemala City, Guatemala. Presented by Mr. William Owen, American vice consul in charge. Received December 28, 1915.

"Seeds from a very large *aguacate*, which I consider the finest product of Guatemala in that line. They are high grown, which will enable the tree to

thrive better in a northern climate. Aguacate trees are not numerous in the immediate neighborhood of this city. I am compelled to depend almost entirely upon the goodness of distant friends." (*Owen*.)

41630 to 41637.

From Shanghai, China. Presented by Mr. H. O. Jacobson, Bureau of Agriculture, Manila, who secured them from Rev. J. M. W. Farnham. Received December 11, 1915.

41630. *AGYNEJA IMPUBES* L. Euphorbiaceæ.

41631 to 41634. *BENZOIN* spp. Lauraceæ.

41635. *EUSCAPHIS JAPONICA* (Thunb.) Dippel. Staphyleaceæ.
(*Euscaphis staphyleoides* S. and Z.)

See S. P. I. No. 41263 for previous introduction.

41636. *VIBURNUM* sp. Caprifoliaceæ.

41637. *ARALIA CHINENSIS MANDSHURICA* (Rupr.) Rehder. Araliaceæ.

See S. P. I. No. 35148 for previous introduction.

41638 to 41672.

From Brazil. Collected by Mr. H. M. Curran. Received December 20 to 23, 1915. Quoted descriptive notes by Mr. Curran.

41638 to 41640. *ABELMOSCHUS ESCULENTUS* (L.) Moench. Malvaceæ.
(*Hibiscus esculentus* L.) Okra.

"Common forms of okra grown in the mountains of Rio Contas, Bahia, Brazil."

41638. (No. 26.)

41640. (No. 56.)

41639. (No. 27.)

41641 to 41643. *ALLIUM CEPA* L. Liliaceæ. Onion.

"Common forms of onion grown in the mountains of Rio Contas, Bahia, Brazil."

41641. (No. 22.) White.

41643. (No. 22.) Yellow.

41642. (No. 22.) Red.

Bulbs.

41644. *ABISTOLOCHIA* sp. Aristolochiaceæ.

"(No. 13.) A very ornamental climber with heart-shaped velvety leaves. Flowers odd and interesting, but not showy. A rapid grower, covering trees and bushes by the river. Common in cleared lands along Rio Contas, Bahia, Brazil."

41645. *BEGONIA* sp. Begoniaceæ.

Begonia.

"(No. 35.) Common wild form in forest of mountains of Rio Contas. Grows close to the ground; 4 to 6 inches; leaf large, entire, flower stalks erect, 2 to 3 feet high, with masses of white flowers. A showy ornamental."

41646. *CAJAN INDICUM* Spreng. Fabaceæ.

Pigeon pea.

"(No. 11.) *Andu branco*. An edible bean, much like species grown in the Orient, but differs in minor ways. A tall bush 4 to 6 feet in height, bearing yellow, pearlike flowers. Planted in clearings in the mountains of Rio Contas, Bahia, Brazil."

41638 to 41672—Continued. (Quoted notes by Mr. H. M. Curran.)**41647. CARICA PAPAYA L. Papayaceæ.****Papaya.**

"(No. 53.) Papaya, called by Brazilians *Mamão*. Common form that grows in the clearings in the mountains of Rio Contas, Bahia, Brazil. Of medium size and excellent flavor; not cultivated, but distributed by birds. Abandoned portions of clearings are often a pure forest of this plant."

41648. CHRYSOPHYLLUM sp. Sapotaceæ.

"(No. 55.) Sapotaceous fruit from wild trees in the forest. The fruit has a thin, tough skin and soft yellow flesh, with a texture much like that of a ripe persimmon. The flavor of the fruit is slightly acid and very agreeable. One of the best forest fruits I have ever eaten. From the forests of Rio Contas, Bahia, Brazil."

41649. CUCURBITA PEPO L. Cucurbitaceæ.**Squash.**

"(No. 37.) Common squash of clearings, Rio Contas mountains, Bahia, Brazil. Small or medium size, green exterior, yellow or orange flesh, of excellent flavor, said to keep six months. The specimens from which these seeds were obtained had very few seeds."

41650. DIOSPYROS GUIANENSIS (Aubl.) Guerke. Diospyraceæ.

"(No. 36.) Wild Diospyros; no common name. A small ornamental tree 20 feet high, 4 inches in diameter. Fruit probably not edible and possibly poisonous. Wood and character of fruit similar to a poisonous species in tropical Philippine forests which is used as a fish poison."

41651. EUGENIA DOMBEYI (Spreng.) Skeels. Myrtaceæ. Grumichama.
(*Eugenia brasiliensis* Lam., not Aubl.)

"With edible fruit. An ornamental shrub or small tree with small leaves."

41652. HIBISCUS BIFURCATUS Cav. Malvaceæ.**Mallow.**

"No. 33.) Common pink mallow of clearings and along river banks. A scandent shrub, or almost a vine. Very effective as seen from the river, with its great masses of pink bloom. Plant climbs 15 to 20 feet, and the slender branches could be trained over porches, etc. A very profuse and continual bloomer and one of the most showy flowers of the mountains of Rio Contas, Bahia, Brazil."

41653. IPOMOEA sp. Convolvulaceæ.

"(No. 29.) Showy vine of clearings; wild and also cultivated. A rapid grower with attractive foliage and large bright yellow flowers borne in profusion. Bahia, Brazil."

41654. ZINZIBER OFFICINALE ROSC. Zinziberaceæ.**Ginger.**

"(No. 58.) Common cultivated ginger of the clearings in the mountains of Rio Contas, Bahia, Brazil."

41655. ORYZA SATIVA L. Poaceæ.**Rice.**

"(No. 18.) Common rice cultivated along Rio Gorguela, Bahia, Brazil. Probably not an irrigated form, but grown in clearings in the forest."

41656 to 41658. PHASEOLUS LUNATUS L. Fabaceæ.**Lima bean.**

"Lima or butter beans, grown in clearings in mountain forests, Rio Contas, Bahia, Brazil. These beans climb over mandioca plants and brush in clearings."

41656. "(No. 15.) White beans, of excellent flavor, borne abundantly."

41638 to 41672—Continued. (Quoted notes by Mr. H. M. Curran.)

41657. "(No. 1.) Black and white Lima beans of good flavor. A common form in clearings."

41658. "(No. 12.) Black and white Lima beans of good flavor. A common form in clearings."

41659 and 41660. *PHASEOLUS VULGARIS* L. Fabaceæ. **Bean.**

"Common beans of the natives, called *Feijões*. With mandioca meal, the staple diet of the common people. Easily cooked and of good flavor. Planted in forest clearings. Plants seen were of bushy habit, but inclined to climb. Many varieties are grown, varying from red to jet black and the common spotted bean. In the mountains of Rio Contas, Bahia, Brazil."

41659. (No. 10.)

41660. (No. 24.)

41661 to 41664. *RICINUS COMMUNIS* L. Euphorbiaceæ. **Castor bean.**

41661. "(No. 4.) Called *Mamoneira*. A small variety growing wild in light sandy soil on clearings near the river. Castor beans form dense thickets on pasture lands in this region. This is the smallest of the three types collected in the region, all of which grow in more or less intimate mixture, and it is said to yield the best oil and the largest quantity."

41662. "(No. 8.) The largest plant and the largest seed; a very heavy bearer. Forms a tree 15 to 25 feet high. Said to yield less oil than the smaller variety. Grows in light sandy soil on clearings near the river. Called *Mamona* or *Carrapato*. Mountains of Rio Contas, Bahia, Brazil."

41663. "(No. 14.) A third form of castor bean, commonly growing wild in light sandy soil on clearings near the river. A tall grower and heavy fruiter. Rio Contas, Bahia, Brazil."

41664. "(No. 25.) Probably the same form of castor bean as No. 14 [S. P. I. No. 41663]. Rio Contas, Bahia, Brazil."

41665. *SICANA ODORIFERA* (Vell.) Naud. Cucurbitaceæ. **Melocoton.**

"(No. 34.) Common half-wild yellow-fleshed melon of clearings, mountains of Rio Contas. It is 12 to 14 inches long by 3 to 5 inches in diameter, with a reddish and tough, not very palatable flesh. A strong grower, which climbs on trees in clearings."

41666 to 41670. *THEOBROMA CACAO* L. Sterculiaceæ. **Cacao.**

41666. "(No. 62.) Var. *Para*. These seeds are from the largest and most nearly perfect fruits found in a young vigorous plantation on new soil; mountains of Rio Contas. They represent the best type of cacao grown in this region. Rio Contas basin is one of the big cacao regions and produces a fine quality of cacao beans."

41667. "(No. 63.) See No. 62 [S. P. I. No. 41666] for description."

41668. "(No. 64.) *Eggshell* variety. A small form of fruit with a thin shell and few seeds. Occurs in all plantations, but not selected for planting, as the yield is less. From a young vigorous plantation on new soil. Mountains of Rio Contas, Bahia, Brazil."

41638 to 41672—Continued. (Quoted notes by Mr. H. M. Curran.)

41669. "(No. 65.) Var. *Para*, called *Maranhão*. Probably the same as Nos. 62 and 63 [S. P. I. Nos. 41666 and 41667], though preferred by certain planters. Large perfect fruits selected by Col. Manoel Couros from trees on his plantation were the sources of these seeds."

41670. "(No. 66.) Var. *Para*. See No. 65 [S. P. I. No. 41669] for description."

41671. *VIGNA SESQUIPEDALIS* (L.) Fruwirth. Fabaceæ.

(*Dolichos sesquipedalis* L.)

Yard-long bean.

"(No. 57.) Yard-long bean; a climbing variety with edible pods. A rapid grower, said to fruit in 30 days. Rio Contas, Bahia, Brazil."

41672. *CITRUS AURANTIUM* L. Rutaceæ.

Sour orange.

"Wild or *Bello* orange. The common orange of clearings. Seeds distributed by birds. A common form in all regions of South America where oranges are grown. A small vigorous tree, practically free from disease. Fruits at an early age and bears an immense crop of dark rust-red perfect oranges. The skins are thick, and they separate from the pulp as easily as those of the mandarin. The pulp is fine grained, very juicy, and with only a slightly bitter taste (in this specimen). Many people prefer this to the sweet orange. To me, it is one of the most refreshing fruits I know. It should prove a good stock for budding, and may prove useful in developing a new variety of table orange."

41673 to 41678.

From India. Presented by Mr. A. C. Hartless, superintendent, Government Botanic Gardens, Seharunpur, at the request of Mr. A. Howard, Imperial Economic Botanist, Pusa. Received December 30, 1915. Quoted notes by Mr. Hartless, except as otherwise indicated.

41673 to 41676. *RUBUS* spp. Rosaceæ.

Collected at Darjiling.

41673. *RUBUS NIVEUS* Thunb.

(*Rubus lasiocarpus* Smith.)

41674. *RUBUS ALPESTRIS* Blume.

41675. *RUBUS CALYCINUS* Wallich.

41676. *RUBUS PEDUNCULOSUS* Don.

(*Rubus niveus* Wallich, not Thunb.)

"A deciduous shrub, with very stout, erect, biennial stems 1 to 1½ inches thick and in vigorous plants 4 to 6 yards high, covered with a thick velvety down and sprinkled over with minute prickles. Leaves 6 to over 12 inches long, composed of three to five leaflets. Flowers white or pale pink, one-half inch across, the petals shorter than the sepals. Fruits blue-black, small. Native of west and central China, whence it was introduced about 1901; the species had, however, been known to botanists as far back as 1825 from plants growing on the Himalayas. The Chinese plants are chiefly remarkable for their vigor; Mr. Wilson states that it is occasionally 20 feet high. It is the most robust of all the Rubi; hardy in Britain, as

41673 to 41678—Continued. (Quoted notes by Mr. A. C. Hartless.)

may be seen by the plants in the Kew collection." (W. J. Bean, *Trees and Shrubs Hardy in the British Isles*, vol. 2, p. 458, under *R. gracilis*.)

41677 and 41678. *RUBUS* spp. Rosaceæ.

Blackberry.

"Collected at Dehra Dun, which is subtropical. These two species have a very wide range as to altitude and are really the two best species from an edible point of view."

41677. *RUBUS NIVEUS* Thunb.

(*Rubus lasiocarpus* Smith.)

"In the Western Ghats *Rubus lasiocarpus* is well known as the blackberry of India. It is even grown with success at Bangalore."

41678. *RUBUS ELLIPTICUS* Smith.

41679. *KOELREUTERIA FORMOSANA* Hayata. Sapindaceæ.

From Taihoku, Formosa. Presented by Mr. Genjiro Takata, chief, Bureau of Productive Industry. Received December 31, 1915.

An indigenous Formosan tree related to *K. bipinnata* Franch., but differing from that species in having subentire leaflets. A small handsome tree with bipinnate leaves and terminal spreading clusters of yellow flowers.

41680. *ELEOCHARIS TUBEROSA* (Roxb.) Schultes. Cyperaceæ.

Apulid.

From Manila, Philippine Islands. Presented by Mr. H. T. Edwards, director, Bureau of Agriculture. Bulbs received December 28 and 29, 1915.

"Small corms of *Apulid*. Larger forms are great favorites with the Chinese." (Edwards.)

"They are mostly eaten raw, but are also sliced and shredded in soups, and in meat and fish dishes. Foreigners in China grate them and serve them boiled as a winter vegetable, in which state they very much resemble sweet corn in looks and taste. The plants need a hot summer to mature and are grown on a muck or clayey soil with several inches of standing water on top, in very much the same manner as wet-land rice." (Frank N. Meyer.)

41681. *MELASTOMA MOLKENBOERII* Miquel. Melastomaceæ.

From Lawang, Java. Presented by Mr. M. Buysman, Jardin Botanique. Received December 30, 1915.

A large shrub or small tree, 15 to 20 feet high, with oblong or ovate-lanceolate, 5-nerved, pubescent leaves and terminal, rose-colored flowers in fascicles of three to five. (Adapted from *Koorders and Valeton, Mededeelingen uit s'Lands Plantentuin*, No. 33, p. 183, 1900.)

41682 to 41684. *TRITICUM AESTIVUM* L. Poaceæ.

Wheat.

(*Triticum vulgare* Vill.)

From Pusa, India. Presented by the Imperial Economic Botanist. Received December 16, 1915.

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THE FARMERS OF THIS COUNTRY are as efficient as any other farmers in the world. They do not produce more per acre than the farmers in Europe. It is not necessary that they should do so. It would perhaps be bad economy for them to attempt it. But they do produce by two to three or four times more per man, per unit of labor and capital, than the farmers of any European country. They are more alert and use more labor-saving devices than any other farmers in the world. And their response to the demands of the present emergency has been in every way remarkable. Last spring their planting exceeded by 12,000,000 acres the largest planting of any previous year, and the yields from the crops were record-breaking yields. In the fall of 1917 a wheat acreage of 42,170,000 was planted, which was 1,000,000 larger than for any preceding year, 3,000,000 greater than the next largest, and 7,000,000 greater than the preceding five-year average.

But I ought to say to you that it is not only necessary that these achievements should be repeated but that they should be exceeded. I know what this advice involves. It involves not only labor but sacrifice, the painstaking application of every bit of scientific knowledge and every tested practice that is available. It means the utmost economy, even to the point where the pinch comes. It means the kind of concentration and self-sacrifice which is involved in the field of battle itself, where the object always looms greater than the individual. And yet the Government will help, and help in every way that is possible.—*From President Wilson's message to the Farmers' Conference at Urbana, Ill., January 31, 1918.*

